Massachusetts Institute of Technology

TECH TALK

April 25, 1973
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CONSTRUCTION STARTS ON NEW BUILDING

$7 Million Anonymous Gift Aids Chemical Engineering

Construction of a new building for its Department of Chemical Engineering was announced today by MIT.

The new facility, costing a total of $13.1 million, will enable the Department and the School of Engineering to strengthen teaching and research in chemical engineering, including the related interdisciplines of energy resources, environmental quality, biology, medicine, and management. The entire capital amount will come from private sources. It includes a ten-year maintenance fund for the new facility.

At a meeting at MIT of the National Sponsoring Committee, formed to assist MIT in the planning and funding of the project, Howard W. Johnson, Chairman of the Corporation, and Jerome B. Wiesner, President, announced that the Institute has received an anonymous gift of $7 million from an alumnus, of which $5 million is to be applied to the new chemical engineering building.

This gift, one of the largest ever given MIT by an individual at any one time, brought total committed support for the new building to $11.7 million and enabled the National Sponsoring Committee to recommend that construction begin.

The National Sponsoring Committee is composed of a group of distinguished alumni and industrialists, headed by J. Kenneth Jamieson, Chairman and Chief Executive Officer of Exxon Corporation. Honorary chairman of the Committee is Warren K. Lewis, Professor Emeritus of Chemical Engineering, the first head of the MIT department and one of the country's foremost contributors to chemical engineering research and education.

Under the leadership of the National Sponsoring Committee, an intensive effort is underway to achieve the balance of approximately $1.4 million through support by alumni, friends of MIT, and leading corporations allied with the chemicals and petroleum industries.

Chemical Engineering as an academic discipline was founded at MIT in 1888 when the first course in this subject anywhere was presented at the Institute. However, the new building will be the first designed and built exclusively to house the department's teaching and research activities. It will be five stories high and triangular in shape and is expected to be completed by the

President Wiesner mans a shovel on the occasion of groundbreaking ceremonies April 13 for the chemical engineering building.

EFFECTIVE JULY 1

Mt. Holyoke College Appoints Emily Wick Dean of Faculty

Emily Lippincott Wick, professor of food chemistry at MIT, has been appointed Dean of the Faculty and Professor of Chemistry at Mount Holyoke College, according to David B. Truman, President of the College. Miss Wick, who replaces William S. McFeely, will assume her new post July 1, 1973.

Dr. Wick received both her AB and MA degrees from Mount Holyoke and served as instructor in chemistry at the college for one year. In November 1972, Mount Holyoke honored her with a Doctor of Science degree and the citation read in part, "As Professor of Food Chemistry on a predominantly male faculty, you have been recognized for first-rate teaching and research in your discipline. You have also won the respect of colleagues and the gratitude of students for your skilled championship of women at MIT, for your unfailing and persuasive sense of humor, and above all for your fundamental integrity—qualities rare in any era but especially valued for their scarcity in these times."

A native of Youngstown, Ohio, Miss Wick completed her education at MIT, receiving a PhD degree in organic chemistry in 1951. Since then she has remained at MIT with the exception of four years which she spent as research chemist in the Flavor Laboratory at Arthur D. Little, Inc. She was the first woman on the faculty at MIT to receive tenure and the first to be promoted through the ranks to full professor.

Professor Wick

Dr. Wick's research in food chemistry has centered upon the trace components of foods and the mysteries of their biological effects. She has published her findings in numerous articles in professional journals, and she is the author, with R. Teranishi and I. Horenstein of *Flavor Research: Principles and Techniques* (M. Dekker, Inc., 1971).

Between 1965 and 1971 Miss Wick served as Associate Dean for Student Affairs at MIT, where her primary responsibility was women students. During her

Chancellor Paul E. Gray said, "As one who has worked closely with Professor Wick for eight years," Chancellor Paul E. Gray said, "my sense of the wisdom and appropriateness of this appointment for Mount Holyoke College and my conviction that Professor Wick will be an effective and distinguished Dean of the Faculty are tempered by my regret that she will no longer serve MIT as she has in the past."

"Dr. Wick's record of accomplishment at the Institute goes beyond distinguished research in food chemistry and effective teaching to encompass concern for and action related to the needs and roles of women in science and technology generally and at MIT specifically." Dr. Gray said. "She has helped us understand these problems and move toward creative and appropriate solutions, and has thereby made a major contribution to the life of the Institute. MIT has been changed by Professor Wick's service here during the last eight years, and all of us who have come to rely on her judgment and her integrity are saddened by our loss, and the Institute's loss, even as we rejoice with her as she takes on major responsibility for the intellectual development of Mount Holyoke College."

(Continued on page 12)

DEVELOPED AT MIT

Associated Press Announces New 'Laserphoto' System

The Associated Press has announced the development of a revolutionary system of photo transsmission by wire using laser beams.

The AP also announced plans for "electronic darkrooms" where pictures will be stored in computers, edited on video screens and transmitted at high speeds. The new systems were developed in 21 years of research by the MIT.

The new laser beam receiver, called "Laserphoto," will greatly improve the quality of photos for AP members by delivering dry glossy prints of photographic quality, cut and stacked at the editor's desk, the announcement said.

Wes Gallagher, president and general manager of the news cooperative, made the announcement prior to the annual meeting, Monday, April 23, of Associated Press members at the Waldorf Astoria Hotel. AP serves 1,259 newspapers and 1,387 broadcast stations in the United States.

"Two and a half years ago the

(Continued on page 12)

Inside:

Full Study Of Grading Is Voted

An intensive study of MIT's grading system is due to begin in the coming months as the result of a vote of the faculty at its monthly meeting last Wednesday.

In other action, the faculty voted to continue the Wellesley-MIT Exchange (see related story), to accept on an interim basis proposals for continuing freshman pass/fail and to endorse a statement by the Committee on Educational Policy (CEP) on the education of women at MIT.

The study of the grading system was recommended by the CEP as a way of bringing about "desirable, and possibly fundamental, changes in grading policy and practice at the Institute."

The faculty, at the suggestion of the CEP, adopted a series of recommendations by the Pass Fail Committee on First Year Grading. The CEP described this action as "a provisional and interim measure, without a specific time limit, that would offer the best immediate answer to difficulties currently perceived in firstyear grading."

The measures adopted, to take effect in the fall term, provide for:

—Continuation of a single passing grade.

—Continuation of the "hidden grades" practice.

—A limitation on freshman credits to 60 units in the fall term and 63 in the spring term.

—The use of an "internal fail" grade in place of a recorded "fail" on the student's transcript.

The CEP in its statement, said that a majority of the committee members "presently favor public recognition of outstanding work in the freshman year and would, in fact, argue that the highest passing grade should be more exclusive than the current upperclass A."

These committee members also believe, the statement said, that such a graded system "would avoid the need for 'hidden grades'

(Continued on page 3)

FILM PERILS

Pauline Kael, movie critic of the *New Yorker*, is a short woman with a miraculously engaging smile. If we were a movie director we'd be tempted to type cast her for the amiably absent-minded mother-in-law part in our latest domestic comedy except for the fact that her eyes, sharp as a bird's behind large round glasses, reveal the humane perception of one of the leading stars in modern cinema criticism.

We went around to listen to the first of her two lectures in Richard Leacock's film course here at MIT one afternoon last week (the second is today) and found her being given a short tour of the premises occupied by the film section in Building 21. As we settled down in the crowded screening room that doubles as a lecture hall, Professor Leacock said that Miss Kael needed no introduction. Miss Kael herself wasted no time getting to the main feature, which turned out to be the perils—professional, intellectual, and moral—of the movie biz.

The movie screened the night before had been Max Ophuls' "The Earrings of Madame D," the story of how a general (Charles Boyer) loses his wife (Danielle Darrieux) to an Italian diplomat (Vittorio De Sica) in a setting of elegant opulence. Miss Kael asked how many of the students had liked it and there was a small show of hands. "I've been a fan of this movie since I was reviewing film in San Francisco for *Pacifica*. But many people resented it because it's about rich people and therefore supposedly trivial. That's one of the troubles: if you make a neo-realistic movie about the poor, it's boring—about the rich and it's trivial. But I think the movie shows that even the rich can be destroyed by emotion. Max Ophuls is a man of delicate sensibility, and saying a movie of his is uncommitted is like telling Boucher or Fragonard that he's uncommitted. Ophuls is a master of camera movement within a scene. He was born in Germany in 1902 and had directed over 200 plays by the time he was 30. His best work was done in Europe. When he came to Hollywood, his work suffered the usual Hollywood interference. Tell me, one of you who didn't like 'Madame D,' why didn't you like it?"

A student raised his hand and remarked that he'd found the characters utterly unconvincing ("Do you like Stendahl? Do you like Mozart operas?" Miss Kael cried out) and went on to say they were too polished: "They don't slip on the stairs, they don't make mistakes. But isn't that just the point of the movie," said Miss Kael with a wonderful smile. "The general is a man who knows just how to do everything, but then his emotions get out of control and he blows it all." Another student thought a series of ball scenes too fragile a way of showing two people falling in love. "My own view is that the ball scenes work in 'Madame D' at least partly because Vittorio De Sica is perhaps the most attractive male in movies," Miss Kael said. "It's not just anyone, you know, who can walk on scene and take a girl away from Charles Boyer. De Sica is 72 now. I had lunch with him not long ago and I thought he was an absolute knockout. In much of my criticism I'm looking for a sense of responsibility and usefulness in a movie, a sense which filmmakers don't always have themselves, a responsibility for the images they send out into the world. As a director De Sica has always sought images that don't make people hate themselves or hate what they are. This, in fact, has been one of Hollywood's worst effects on the world, the steady diet of images that tend to make people unhappy with who and what they are. We used to think of movies simply as fantasies and the glamor and all the rest were seen as not really damaging. But we are no longer so innocent and now we can see the damage even fantasies can do.

Someone asked Miss Kael about her own responsibility as a critic to give attention to short films, which are seldom reviewed. "I see a lot of short film," she said, "and I try to help promising young filmmakers get grants to make them. But I don't generally review them because a critic has to be effective and that means writing about the films that most people are going to see. The sad fact still is that theater owners know that people buy tickets for the feature. I believe, however, that it is vital to find a way to get good short film shown, and not just in festivals. A critic has to be a writer, too, because you just become a bore otherwise. And you can't lie. The reason you don't remember the names of so many movie reviewers is that they don't tell you the truth. I write a lot of pieces to push good films that might be dumped by the producers if there didn't seem to be some critical response. M* A*S*H was one of those movies that would just have played a few art houses if critics hadn't praised it.

"Movies are far more interesting now than they used to be. The old Hollywood has simply moved over to TV. I love movies that are botched but have something completely new in them. If they have that, who cares if they fall apart around the edges, or even at the center? Movies are no longer the mass entertainment medium they once were; now it's TV that has the audience of 80 million. The audience for movies is you. Movie critics have the responsibility not only of pointing out what's going on under the surface, but of fighting for the few really good films, as Agee did for 'Henry V.'"

Someone remarked that movies turned out a good deal of social propaganda. "I'm afraid Hollywood is concerned only with money," Miss Kael said. "If you can make a movie about a black killing whitey and make money at it, you make it. Success is a corrupting factor in itself, and the main concern in Hollywood is to make a successful movie. It's imperative for the filmmaker who wants to get something done to bypass Hollywood. I know a director who has 26 days to do a film it took three years to make the deal for." Someone asked what Miss Kael thought of "Milhous." "I thought it was a morally corrupt movie," she replied. "Implicit snobbery, rather than getting into real issues." What about cinema verite, several students wanted to know. "I believe art can generally say something better than just the raw material of reality," Miss Kael said. "In art you distill from reality."

OUTSTANDING MINORITY SENIOR

John Mack Named Fort Fellow

John L. Mack, 30, of Newburyport, has been selected as the first recipient of MIT's new Marron W. Fort Fellowship for an outstanding minority senior.

Mack expects to receive the S.B. degree in urban studies and planning in June and to enter the doctoral program at the Sloan School of Management in September. His goal is to bring the tools of sophisticated technology and management to bear on urban problems.

"This is the greatest honor I have ever received," Mack said. "I treasure it particularly because I live in the town where Dr. Fort spent much of his life. People in Newburyport still remember him and speak well of him, so I have developed a warm, personal feeling for him."

The Fort Fellowship was established by MIT to encourage MIT minority undergraduate students with scholarly qualities to consider graduate study at the Institute. The Fellowship covers tuition and living expenses for nine months.

A native of Philadelphia, Mack was graduated from Germantown High School in 1960. After attending Lincoln University in Pennsylvania for a year he enlisted in the US Navy.

Upon completion of basic training, Mack was chosen the outstanding recruit among more than 1,000, and received the American Spirit Medal of Honor. He also was selected as Company Honor Man for superior performance on skills tests.

After five years in the Navy, Mack worked as an electronics technician in industry before entering MIT in 1969. He was a member of the first Interphase Project, a special prefreshman summer session designed to introduce students from disadvantaged educational backgrounds to MIT's academic program. Mack participated in the voluntary program chiefly because of the long lapse in his formal education.

Mack has been active in numerous MIT and community groups. He served as a member of the Technical Training Advisory Committee which advised the administration on a technical training program for minorities and as a member of the task force on minority education. He has been a member of MIT's Black Student Union since coming to MIT, and served as its co-chairman in 1972.

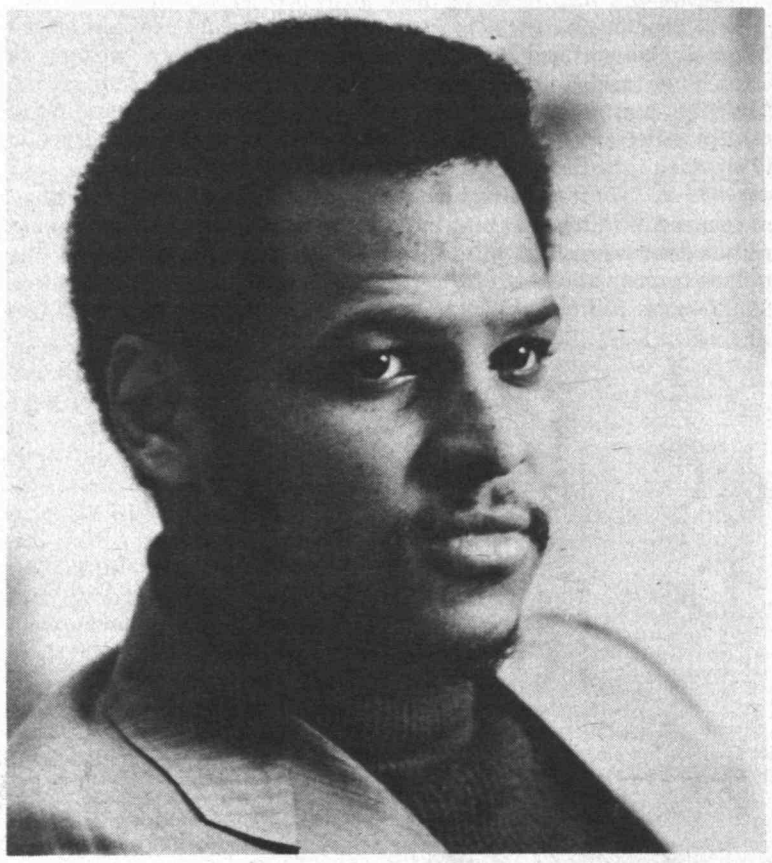
He has served as a member of the steering committee of Urban Action and as a member of the board of trustees of the MIT Community Service Fund. For two years he was a teaching assistant in the Lowell Institute School computer course.

In the Greater Boston community, Mack has been a tutor at the Dearborn School in Roxbury and a member of a planning group for low-to-moderate income housing in Newburyport. He is president of the board of directors of the Cambridge Community Center.

Mack, who is also a member of Mensa, has been selected to be listed in the 1973 edition of Who's Who in American Colleges and Universities.

Mr. and Mrs. Mack, the former Bettie Taylor of Baltimore, have four children and reside at 56 Kent Street, Newburyport, Mass.

The Fort Fellowship was established in memory of Dr. Marron William Fort, one of the first known black Americans to receive a Ph.D. from MIT. Dr. Fort received the S.B. and S.M. degrees in 1926 and 1927 in electrochemical engineering from MIT, and the Ph.D. in chemistry in 1933. He went on to a distinguished career as an educator and chemist.



John L. Mack, Fort Fellowship winner. —Photo by Margo Foote

Weatherall Takes on Post In Personnel Development

The appointment of Robert K. Weatherall as acting director of personnel development was announced today by John M. Wynne, vice president, administration and personnel.

"The search for a highly qualified person to head MIT's career development and training programs will continue," Mr. Wynne said, "but to make further progress in our effort to increase career opportunities and personal development at MIT, Mr. Weatherall has agreed to devote a substantial portion of his time to this effort. He will continue to carry out his principal operating responsibilities as Director of Career Counseling and Placement for the Institute."

The search for a well qualified, full-time person to take the responsibilities of director of personnel development has, up to this time, been focused almost entirely on seeking out potential candidates from within the Institute, Mr. Wynne said. "While many able people have indicated an interest in the position," he said, "none would have brought to it the particular combination of experience in the organization and administration of training programs and in building a program of career development which we see as the desired qualifications for the position."

The search will now be extended outside the Institute to broaden the possibility of attracting a person with the requisite experience and skills into this important post, he said.

Mr. Wynne expressed his pleasure at Mr. Weatherall's readiness to take on this additional assignment. "By experience and interest, Bob Weatherall will be able to contribute significantly in this interim period to furthering our career development efforts. His own work in career counseling and placement of students and alumni has given him an understanding of individual needs for growth and challenge and patterns of career opportunity. His work as a member of the Subgroup on Internal MIT Education of the Hollomon Task Force on Continuing Education has given him a comprehensive overview of the Istitute's training and development needs and opportunities."

Mr. Weatherall came to MIT in 1956 as a member of the dean's office staff. He has subsequently served as assistant and associate director of admissions, executive officer of the Graduate School and as a research associate. A graduate of Cambridge University in 1953, he lives in Ipswich where he serves as Ipswich's member on the Whittier Regional Vocational and Technical High School Committee.

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Editor
Joanne Miller
Managing Director
William T. Struble
Staff Writers
Charles H. Ball
Ellen Burbank
Robert M. Byers
Victoria deCuenca
Sally Hamilton
Linda Omohundro
Peter Spackman
Business Manager
Paul E. Johnson

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Please address all news and comment to the editorial office, Room 5-111, Ext. 3-3277.

Key Points On the Issue Of Pass/Fail

These were highlights of the CEP's summary of the "four central" points of the pass/fail issue:

1. Reduction of competitive anxiety vs. public recognition of outstanding performance.

For the freshman year, those who favor the single passing grade would argue that the transition from high school to college has become significantly eased by pass/fail, and that pass/fail has permitted a new and valuable mode of educational exploration during the freshman year.

Those who oppose the single passing grade would argue that disadvantages due to insufficient commitment and superficial engagement by students may have come to outweigh the possible benefits, and that failure to recognize outstanding work can eventually imperil the Institute's tradition of excellence.

2. Confidential recognition of outstanding work (to be released at the student's request but not recorded on the official transcript) vs. either public recognition (on the transcript) or no recognition at all.

Those opposed to approval of "hidden grades" practice argued that it undercut a basic principle of pass/fail—namely, that average or marginal performance should incur no later public penalty, either implied or explicit.

Those who favored some measure of "hidden grades" practice argued that the practical use of such grades would be limited to a few subjects.

3. Limitation on units registered for vs. no limit.

Perceptions of student motives and attitudes in carrying heavier than normal unit loads in the first year vary widely—both among faculty and among students.

Some argue that the present freshman year offers a precious and unpressured opportunity to explore the educational and research areas of the Institute.

Others argue that a primary reason for heavy unit loads is the desire to accumulate degree credits under pass/fail.

4. F grade on the official transcript vs. F grade on temporary records for internal Institute use (with no record of subject or grade in the permanent transcript).

Those who favor the internal fail argue that it will raise the now-too-low threshold for obtaining passing credit, since teachers will be more willing to use the F grade, and that students will still view the F grade as a penalty because of its appearance on internal records.

Others doubt the value of the internal fail, arguing that students will ignore the penalty aspect of the F grade and continue to the end of term in courses which they would otherwise drop under the current system, in the hope of possibly receiving a passing grade.

Faculty Votes Full Study of Grading System

(Continued from page 1)

and place a natural limit on overloading."

"At the same time," it said, "the CEP recognizes that such a system for the freshman year would represent a major and fundamental change in the Institute's approach to the freshman year."

"Such a change cannot be made lightly," it said. "Any such change should involve extensive discussion and consultation among students and faculty and should be made in the context of a more general study of the full grading system."

The Student Committee on Educational Policy, in a statement issued at the faculty meeting, had opposed "hidden grades" and the limitation on credits, which it said was "unfairly restrictive on those who can competently and beneficially handle more."

The limitations also were opposed by Assistant Professor Gordon E. Nelson of the Department of Foreign Literatures and Linguistics, who said they could lead to "a serious decrease" in the number of freshmen taking language subjects, and by Assistant Professor Margaret L. A. MacVicar of the physics department, who claimed that the action represented an "abdication of responsibility" by the faculty and advisors in helping students plan their programs. She also mentioned a possible adverse effect on UROP registrations.

Arguments in favor of the limitations were given by several faculty members, including Professor Arthur P. Mattuck of the mathematics department, chairman of the ad hoc Pass/Fail Committee.

The points they made included these:

There are limits on what faculty advisors can do to prevent overloading; there is peer group pressure on freshmen to take heavier than normal unit loads; freshmen with overloads may give less effort to subjects, threatening the overall quality of the courses; credit limits will encourage freshmen to diversify their activities into extra-curricular areas.

Some concern was expressed during the discussion of the pass/fail proposals about their possible effect on the admission of MIT students to medical, law and graduate schools. One of the questions raised was whether the elimination of failing grades from official records might prove misleading or cause confusion.

Mattuck replied that a statement would appear on the official transcript saying that failing grades are not given or recorded in the freshman year.

It was also suggested that graduate schools are not greatly interested in freshman grades.

The faculty voted 66-33 against a proposed amendment that would have struck out the limitation on credits.

The vote to adopt the interim measures and to establish an ad hoc committee to study the full grading system was 82-14.

The ad hoc committee's study, as suggested by the CEP, "would include such matters as more explicit guidelines for grading, the assignment and use of credit units for subjects and the role of the drop date in the grading system."

The CEP said it would formulate a detailed charge for the ad hoc committee and ask the President and the Chairman of the Faculty to appoint its members. It recommended that the committee make its report during the 1973-74 academic year.

President Jerome B. Wiesner said after the meeting that the committee would be named shortly and would begin its work by the start of the new academic year.

The CEP "Statement Concerning the Education of Women at MIT" (*Tech Talk*, April 18) was presented to the meeting by Professor Hartley Rogers Jr., faculty chairman.

The statement said that MIT "must accept women as significant members of the community and support them in setting and attaining their goals—goals which may not fit society's or MIT's standard expectations."

The statement urged that MIT recruit more women faculty members and students and work to change the Institute's image as a male bastion.

Professor William M. Seibert of the electrical engineering department asked what "practical consequences" could be expected from the statement, which he described as "pious."

Rogers, who said he was not often "accused of piety," replied that the image MIT "presents to the outside world" was an "operational problem" that could be overcome quickly.

A more fundamental change, overcoming anti-female attitudes, was primarily the responsibility of the faculty, he said.

A "first step," he said, was to have the faculty take cognizance of the problem as it relates "to what goes on in the classroom."

Rogers said this would require an "increased awareness of the present atmosphere, attitudes and expectations."

"We find some damaging experiences that take place in the classroom," he said, adding that a "heightened level of consciousness" was needed to guard against discrimination.

President Wiesner commented that all women, not only students, have special problems at MIT, although "women students, more than others, are at the mercy of MIT."

He suggested it might be enlightening for departments and laboratory groups "to invite women to sensitivity sessions of the kind the Academic Council had last spring."

He said the over-all problem was not so much the result of "cussedness" as it was of "thoughtlessness."

The final item on the agenda, acceptance of the MIRV report, was put off until the next faculty meeting on May 16.

Faculties Urge MIT, Wellesley Explore Cooperative Efforts in Additional Areas

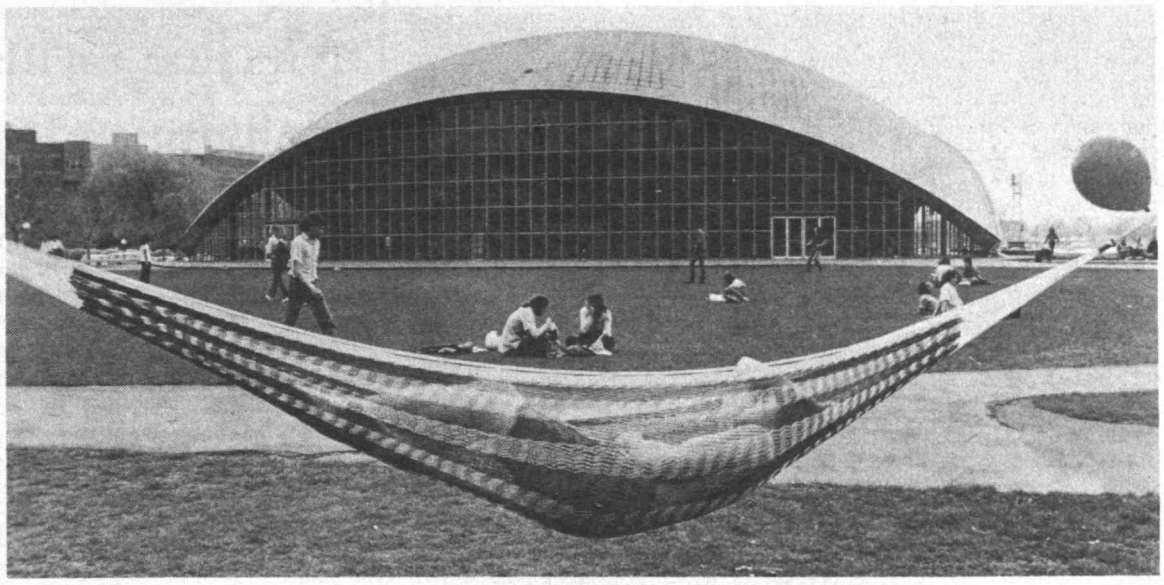
The faculties at Wellesley College and MIT have formally decided to continue an exchange program of cross-registration which widens the educational opportunities available for Wellesley students at MIT and for MIT students at Wellesley.

The respective faculties also urged that the two schools explore still other areas of cooperation between the two institutions.

These should include, the resolutions said, faculty teaching exchanges, joint teaching, cooperation in the arts, expanded libraries, research, particularly in educational and clinical research and in field projects.

The exchange program was conducted on an experimental basis over the past five years, with transportation between Wellesley and MIT provided by the two schools.

Concern at MIT over continuation of the exchange dealt with its effect on MIT's own women students. MIT's Committee on Educational Policy, which recommended MIT approval of continuation, warned that the program "must not become a substitute for actively recruiting and improving the position of women students at MIT."



Margo Foote, Tech Talk photographer, caught a student napping and a full Kresge ellipse.

GROWING CAREER FIELD

Moot Court to Offer Pre-Law Practice

Though MIT has no law school, it will have—for the first time this spring—a series of moot court sessions in which students will argue real and hypothetical Supreme Court cases before panels of lawyers acting as judges.

Moot courts, which are a required part of the legal curriculum, provide students opportunities to develop and test courtroom procedures before beginning the practice of law.

At MIT, the MIT Moot Court of Appeals is part of subject 11.12, Urban Law: Application of the Fourteenth Amendment to Critical Urban Problems, taught by associate professor William A. Davis, Jr.

"With more and more MIT students voicing an interest in law as a career, I saw this as an opportunity to introduce various urban problems at a Constitutional level," Professor Davis said.

"About half the 25 students enrolled in the subject have said thev are interested in going to law school," he said. "I estimate that about one-third of the class will enter law school. For those who do, I think these moot sessions will be especially helpful, as well as being interesting for everyone in the class."

The first case will be heard today, Wednesday, April 25, at 4:15pm in Room 400 of the Student Center. The issue is the award of tenure at a private university to a male faculty member in preference to a female faculty member whose qualifications and background are approximately the same.

"No such case has yet come before the Supreme Court," Professor Davis said, "but it's probably only a matter of time before one does."

Arguing the first case, Justine Hopkins, Appellant, v. The Trustees of Oak Park University, Appellees, will be Rory Albert, a junior in management from Brooklyn, and Kathy Maloy, a junior at Wellesley for the appellant. Serving for the appellee will be Joel Weissman, a sophomore in urban studies from University Heights, Ohio, and Kenneth Isaacson, an undesignated sophomore from Rochester, N.Y.

Judges for the first court are Professor Davis and Dr. Pauli Murray, Stulberg Professor of Law at Brandeis University, who, as a practicing attorney, has promoted the causes of racial and sexual equality.

Future moot court cases have all been decided recently by the Supreme Court. However, the students who will argue them have not had access to the briefs or to the actual Supreme Court opinions. They do have the facts as determined by the lower courts.

Full details on the future moot court sessions will be listed in the Institute Calendar.

Offshore Oil: Team Presents Data for Public Debate

An MIT study on the economic and environmental impact that possible oil development in the Georges Bank area would have on New England received widespread press coverage in the region.

Newspapers in the six-state area showed their concern about oil-related problems—which include the oil import quota, winter oil shortages and off-shore oil spills—by carrying detailed reports on the findings of the MIT Offshore Oil Task Group of the MIT Sea Grant Program.

John W. Devanney, III, associate professor of ocean engineering, was project manager for the group.

The study, which took a year to complete and cost $105,000, was sponsored by the National Sea Grant Program, the New England Regional Commission and the New England River Basins Commission. It was called the Georges Bank Petroleum Study.

Georges Bank, the region's richest fishing grounds, is located 70 to 100 miles east-southeast of Boston, It frequently has been mentioned as a likely area for oil exploration and development, but the report of the MIT group made no attempt to predict the probability or size of an oil discovery there.

The purpose of the group's research was not to advise New England what its off-shore policy should be, Professor Devanney said, but to provide information on which the region could base public discussion.

To do this, the researchers set up hypothetical situations to determine the implications of various combinations of oil finds, refinery locations, foreign crude oil prices, import quotas and natural gas pricing policies.

The MIT team found that the amount of regional income New England must pay to nations exporting oil is the "single most important variable" in determining the region's available income for other goods and services. And it also concluded that New Englanders will have to pay an increasing share of their incomes to these nations in the next decade and beyond—the amount perhaps double or triple what it is today—no matter how much oil is discovered off New England or how big a refinery complex is built.

Other major findings were these:

—Pressures to find and develop oil on Georges Bank are not dependent on the oil import quota. If the quota were abolished, the only noticeable result would be a reduction in lease bids.

—A major oil find on Georges Bank would not affect the price of oil products in New England unless production from the off-shore area could meet essentially all of New England's needs—an unlikely proposition. Failing this, US crude oil prices would be pegged to the price of the most expensive alternative source.

—The chief value in finding off-shore oil would be in the lease and royalty payments the states might receive if the federal government did not take control of the discovery.

—The best possibility for handling crude oil is a deep-water refinery. A deep-water location such as the one suggested for the Machiasport, Me., area, would be only slightly less costly than the same kind of complex located elsewhere on the East Coast. The lowest cost refinery option would be a complex in southeastern Massachusetts that carried oil products by pipeline to Boston, Providence, Portland and other coastal cities.

—An off-shore oil find would have little effect on employment in the area, although a major New England refinery complex could reduce unemployment.

—Off-shore oil activity apparently is possible without destroying the delicate ecology of the area, where many commercially valuable species of fish spawn and feed. However, near-shore spillage from coastal tanker traffic or refineries would pose a "substantially more severe biological problem."

—The likelihood of a Georges Bank spill coming ashore is nil in the winter and no more than 5 percent in the summer, reflecting seasonal differences in prevailing winds. Such a spill sould require 30 days to come ashore, but would not be a contiguous spill because of dilution by winds, tides and waves.

—The potential of large near-shore products spills would be greatly increased by the use of vessels rather than pipelines. Such spills could have serious effects because of the shallow water, high density marine life and the inability of the shellfish to cleanse themselves in restricted areas.

The researchers, in addition to Devanney, were Joseph B. Lassiter III, assistant professor of ocean engineering; Morris A. Adelman, professor of economics; James A. Fay, professor of mechanical engineering; the late Edwin R. Gilliland, Institute Professor; David P. Hoult, associate professor of mechanical engineering, and Stephen F. Moore, assistant professor of civil engineering, H.S. Lahman, DSR engineer, Department of Ocean Engineering, and R.J. Stewart, research assistant, Department of Ocean Engineering.

SCHOLDER'S ART REVIEWED

A Message Understood in Wounded Knee

The following review by Robert Taylor appeared in the April 18 edition of the Boston Globe and is reprinted here with permission.

In the marvelous show of paintings and lithographs by Fritz Scholder at the Hayden Gallery, MIT, through May 5, the tiny band of Hunkpapa Sioux wiped out by the Seventh Cavalry at Wounded Knee finally has its revenge.

Lest this sound journalistic, that Scholder is using art to preach an obvious message about man's inhumanity to man, let me point out the revenge is bloodless. He is an artist, and his work has received critical buckshot from American Indians precisely because he does not fabricate cliches. His "Super Indian," a resplendent horseman of the plains, wears a shaggy buffalo headdress. "Super Indian" also brandishes a double-dip strawberry ice-cream cone.

"Taboos set by the dominant culture are my targets," says Scholder who is part Indian, in a statement displayed by the gallery. "Massacred moments from a rich recent history, dog delicacies, Kabuki-Hopi maidens, stars-and-striped savages and Gallup drunk derelicts are to me the true Indian images."

Because he has developed a language through which a contemporary awareness may be shared, Scholder speaks about the cultural situation of the Indian as neither militants nor anthropologists can. What he portrays is in fact a society trying to make meaningful the artifices of ritual, corn-dancing, big medicine, in a world where those symbols have been drained of their potency.

The ambiguity of his vision has a provocative complexity. His pigments are rich, his grounds flat, his figures generalized. Sometimes he seems on the verge of bitter social protest—a face mimics the features of a totem-mask, an ectoplasmic headdress threatens to flutter away, a Sioux wearing shell-choker, eagle feathers and breast-plate grimaces like a skull—but the strangeness of the Indian image in context always preserves it from heavy-handedness.

Scholder has sometimes been compared to Francis Bacon, the Dublin-born English painter. He manipulates the materials of panic, what it feels like to be trapped in a culture that no longer exists, the dissolution of forms into wipes and blurs. But he also has a sense of humor. He is fond of the theme of the Indian actor; the acrylic "Indian Posing," presents a profile figure sporting a predatory bird and breechclout, leaning forward, chin-on-hand, self-consciously.

The paintings are executed on a large scale: Indians as monsters, victims, comedians, distortions of romantic white pieties, mountebanks, bubble-gum card figures, rebels ("Sioux War Party, red-orange colors rather than the image of Indians on distant ponies), massacred stars-and-striped Gallup drunks. There isn't a noble savage in the place. They would know what Scholder is saying in Wounded Knee, but whether they would recognize the liberating power of his art is another matter.

Scholder, "Indian Image 1972." Loaned by the National Collection of Fine Arts, Smithsonian Institution.

Merilee Grindle Receives Collamore-Rogers Award

Marilee S. Grindle, 27, of Lincoln, has been named the first winner of the Collamore-Rogers Fellowship for women graduate students at MIT.

Mrs. Grindle, a second-year graduate student in political science, was described by her faculty nominators as "one of the most promising students ever to enter the department."

A native of Seattle, Wash., Mrs. Grindle attended Wellesley College where she was graduated with high honors in political science in 1967.

From 1967-69 Mrs. Grindle served in the Peace Corps as a health care worker in the Dominican Republic. In 1970 she taught in the New Bedford Public Schools' Non-English Speaking Program.

Mrs. Grindle began her graduate studies in 1971 at Brown University and transferred to MIT last fall. Her work here has centered on the political and economic development of Latin America.

The Collamore-Rogers Fellowship was established as part of a continuing program to attract more women to the MIT Graduate School and call attention to their contribution to graduate education. The Fellowship pays full tuition plus a stipend of $2,700 for the academic year.

According to Dr. Irwin Sizer, dean of the Graduate School, judging by the selection committee was made extremely difficult because 16 of the 23 graduate departments had nominated outstanding candidates for the award.

Dr. Eugene B. Skolnikoff, head of the political science department when informed of the award said, "We are very pleased that one of our students was selected to receive the first Collamore-Rogers Fellowship.

"The Department has achieved an enviable reputation within the profession for producing outstanding female PhDs. When Mrs. Grindle receives her degree she is certain to enhance that reputation," Dr. Skolnikoff said.

MIT Student Wins Award For 1st Time

Research Corporation, a New York-based foundation for the advancement of science and technology, has awarded the Joseph Warren Barker Fellowship in Engineering to an MIT student for the first time.

Recipient of the 1973 award is Peter W. Huber, a graduate student in mechanical engineering from Geneva, Switzerland. The fellowship carries a stipend of $6,000 and a contribution of $2,000 to the Fellow's department.

Eligibility for the fellowship requires a bachelor's degree and clearly formulated plans for advanced work leading to a professional career in engineering or engineering administration. Engineering schools may select one nominee each year to be judged against candidates from across the country for one annual fellowship.

The fellowship is named for Dr. Barker, former dean of engineering at Columbia University and former president and chairman of the board of Research Corporation.

On the Synthesis of a Gene: Papers from MIT Laboratory Report On Work Now 85 Percent Complete

By PETER M. SPACKMAN

Two papers from the laboratory of Nobel Laureate Har Gobind Khorana, Albert P. Sloan Professor of Biology and Chemistry at MIT, reporting progress toward the artificial synthesis of a gene, now 85 percent complete, were delivered Thursday, April 19, at the annual meeting of the Federation of American Societies for Experimental Biology, held in Atlantic City, N.J., last week.

Professor Khorana's paper, titled "The DNA Sequence Adjoining the CCA End of the Tyrosine tRNA Gene," deals with the still unsolved biological question of what coded genetic signal marks the stop and start of the process by which the gene transfers its message.

The other paper, delivered by Marvin H. Caruthers, an associate of Professor Khorana's and a senior research scientist in biology at MIT, is titled "The Synthesis of the Gene for the Precursor of the E. Coli Tyrosine Suppressor Transfer RNA," and reports on the step-by-step process of building and joining the 126 bases of that particular gene in the laboratory's test-tubes.

The work reported in the two papers is related in that the potential solution to the stop-start problem will be incorporated in the completed tyrosine gene. If it then fulfills its biological role, a major advance in understanding the biological meaning of DNA's physical structure will have been accomplished.

Ever since the discovery of the Watson-Crick model of the DNA molecule—the famous double helix whose delicately contorted strands contain the cipher of life itself—biochemical detectives have been bent on reconstructing the genetic code in the laboratory. Professor Khorana is the first man to achieve the total synthesis of a gene, the gene for alanine transfer RNA from yeast, which was constructed by him and his research team in 1970 while he was co-director of the Institute for Enzyme Research at the University of Wisconsin. Now at MIT, Professor Khorana and his group are near the completion of the second synthetic gene, after several years' work of painstaking precision.

Nowhere in the world of science is the comforting maxim of the common man that genius is nine-tenths hard work so evident than in the elegant collective effort to elucidate the elusive genetic code. Gradually over the past 20 years there has developed an increasingly rigorous understanding of the complex chain of events through which the specific information coded in DNA controls the production of specific proteins.

As is well known, a gene is a section of the long fibrous molecule of deoxyribonucleic acid, or DNA, made up of two strands wound about each other in helical form. Each strand is composed of four basic building blocks, the nucleotides, which are the bases adenine, thymine, guanine and cytosine (represented by the letters A, T, G, C) strung together with 5-carbon sugar molecules and linked with phosphate ester bonds.

The DNA duplex is in the form of helical ladder in which the two long strands are complementary, the A's of one strand always bonding with the T's of the other while the G's bond with C's.

Sequence Forms the Code

The order of the nucleotides along the DNA strand constitutes the coded genetic information and is the basis of the complex and elegant chain of events by which the four-letter language of DNA is translated into the twenty-letter language of proteins. It has been determined that each series of three nucleotides specifies one of the twenty amino acids from which proteins are made, and the order of these triplets, or codons, by specifying the order in which amino acids are added to a growing protein chain, determines the particular protein molecule to be made.

The physical assembly line that manufactures proteins in the living cell is as elaborate as it is precise, and depends on the complementarity of the DNA duplex. In a way not yet fully understood, the DNA helix unwinds, allowing a molecule of single-stranded RNA to form as a complement to one of its strands, which acts as a template, specifying in reverse the order of the RNA nucleotides.

The RNA molecule, known as messenger RNA (mRNA, for short) because it carries the genetic message, moves when fully formed to a site in the cell known as a ribosome, which acts as a kind of jig for positioning amino acids in the order specified by the mRNA.

Role of Transfer RNA

Meanwhile another sort of RNA molecule, also formed on the DNA template and called transfer RNA (or tRNA), picks up the single particular amino acid it is coded to receive and transfers it to the ribosome. The mRNA molecule, apparently running through the ribosome somewhat as punched coded tape runs through a Teletype, positions successive triplet codons to match with tRNA molecules and add amino acids in the proper sequence.

Professor Khorana's first synthetic gene—a DNA duplex corresponding to the sequence for yeast alanine transfer RNA and hence the gene for that RNA molecule—consisted of 77 base-pairs, or nucleotides, which were joined together in 15 smaller sequences, or oligonucleotides. The gene he is working on at present, the gene for the bacterial molecule *E. Coli* tyrosine suppressor transfer RNA, is composed of 126 base-pairs and will be put together from 26 shorter sequences.

Scientists had previously learned how to extract small sequences of the genetic material from living cells and make copies of the natural material in the laboratory. Professor Khorana, who shared the 1968 Nobel Prize in Medicine with Robert Holley and Marshall Nirenberg for their work in determining the genetic code, was the first to show, however, that genes can be synthesized entirely from their atomic and chemical constituents, the nucleotides.

Completion by End of Year

Professor Khorana and his colleagues expect the tyrosine suppressor tRNA gene to be finished before the end of this year. The reason it takes so long is that literally hundreds of discrete steps must be taken along the route to the ultimate goal.

Beginning with groups of two to four nucleotides, Professor Khorana and his co-workers chemically synthesize single strands of DNA, each about 10 to 15 units long. Each length is fabricated so that its last four or five bases will complement the first four or five of the next section, thus starting to build up the double helix.

These short sections, when mixed together in the test-tube, find their complementary parts on their own, each section acting as a kind of splint for the two adjacent complementary sections and holding them in place while an enzyme called a ligase neatly ties a phosphate ester bond between the two ends.

Of the gene's four major sections, two have now been joined and the chemical conditions needed to join a third have been determined. The precise plan for adding the fourth and final section is still being worked out.

To Solve Some Questions

The point of Professor Khorana's gene is not only making it, but using it, when made, to solve some outstanding biological questions. Although the genetic code is now fairly well understood, little is known about how the DNA molecule signals the beginning and end of the transcription process by which RNA and, in turn, proteins are made.

Presumably, there are start and stop signals on DNA that allows synthesis of the correct mRNA to initiate protein production in the ribosome and halt it when the specified protein molecule is complete. So far, however, no one knows precisely what or where these signals are or how they operate, and Professor Khorana hopes to use the tyrosine gene to find out.

In the living cell the gene would produce a 126-base pair tRNA precursor, which is then cut by an enzyme between pairs 85 and 86, leaving a mature tRNA of 85 units. Is the coded signal to begin transcription located in the remaining 86-to-126-pair sequence? If so, where and what is it?

Finding Role of tRNA

Further along the road is the problem of determining with exactitude the role of tRNA in protein production. Following in the steps of the classical geneticists, but with a precision they could only have wished was possible, Professor Khorana plans to induce mutations in the tyrosine DNA duplex.

By substituting base-pairs, he will thus systematically alter the tRNA produced by the gene; subsequent observation of the altered tRNA's behavior should shed much light on the roles played by the various parts of the tRNA molecule.

Professor Khorana sees his work following a third, and more distant, path that lies in the direction of synthesizing genes for insertion into cells missing them. "One could in the near future," he says, "begin to undertake the synthesis of the genes for polypeptide hormones such as insulin and ACTH, and these would be excellent candidates for insertion into the genomes of cells lacking these hormones."

Controversial Matter

Professor Khorana is well aware of the current controversy over such genetic manipulation. He says: "I know that research such as this has the potential for being used two ways, but that potential exists as a result of any basic research. If all research that could be used two ways were to be halted, then no research could be performed."

Professor Khorana once wrote: "In the years ahead, genes are going to be synthesized. The next steps would be to learn to manipulate the information content of genes and to learn to insert them into and delete them from the genetic systems. When, in the distant future, all this comes to pass, the temptation to change our biology will be very strong."

That prophecy was at least partly self-fulfilling, for it was written just two years before Professor Khorana himself synthesized the first gene.

STUDENT PROJECT

This Mower Keeps Everything in Trim

MIT students are a bit old for tricycles.

But one of them has used the basic design of the traditional childhood three-wheeler to build a man-powered riding lawnmower.

Michael Shakespear, 22, a senior majoring in mechanical engineering, of (4141 Wendell Road) Orchard Lake, Mich., developed the lawnmower as a senior thesis project, and described it at a Symposium on Undergraduate Research.

It is similar to other riding lawnmowers—the person doing the mowing is seated on the machine—except that it is moved by pedal-power instead of a motor.

The concept enables the mower to sit down on the job, but still get some exercise, and this is what Shakespear had in mind.

"The goal of the project," he explained, "is to investigate the feasibility of combining utility and exercise."

Shakespear said that the design problem was "quite interesting."

"Because the power source is limited," he said, meaning the mower, "efficiency has to be optimized and weight minimized."

In addition, he said, any lawnmower has to have good maneuverability and the ability to reach edges and corners. And because riders will pedal at different rates of speed, depending on their strength and stamina, the cutter has to work well at slow and high speeds.

Whether the world is ready to beat a path to the door of the man who builds a man-powered riding lawnmower may be a question for the future.

For the moment, Shakespear is contenting himself with the fact that the project provided a "good learning experience" and "a solid realization of what is entailed in transforming a design concept into a reality."

"It is much easier to think abstractly about a differential than to machine one so that it does not bind," he commented.

The next step in the project is some field testing.

Michael Shakespear demonstrates his mower on the lawn of the Great Court. —Photo by Margo Foote

THE INSTITUTE CALENDAR

April 25 through May 4

Events of Special Interest

Draper Flight Facility Spring Carnival
Departmental faculty, students and guests with special aerospace talents will discuss the wide-ranging challenges in aerospace. With a picnic lunch, flight display and door prizes that include flights in an airplane. Sat, Apr 28. Buses leave from outside Kresge at 10:15am, and return about 2:45pm. Sign up with Miss Sueanne Smith, Rm 33-217 or at a booth in Bldg 10 Lobby on Apr 23-27.

Advisory Committee on Shareholder Responsibility
Thurs, Apr 26, 5:15pm, Rm 10-300.

Childern's Spring Festival
Presented by MIT's Urban Action Volunteer & Resource Center. Festivities include a puppet show, mime group, a clown, tribal rythms troupe, races, and game booths. Refreshments. Sat, Apr 28, 1pm-4pm, Kresge lawn.

Cabaret Evening
Benefit for the MIT Urban Action Volunteer & Resource Center. Evening will include food, music and your own beverages. Admission free with donations accepted for UAVRC projects. Sat, Apr 28, 8pm, Rm 10-105.

Electrical Engineering Counseling Meeting
Discussion of admission and financial aid to graduate schools and employment prospects. For Course VI Juniors and students interested in Course VI for graduate work. Mon, Apr 30, 4pm, Rm 10-250.

Orientation Meeting for Undergraduates Interested in Management
Discussion led by faculty and students in the Department of Management concerning careers and programs in this field. Wed, May 2, 7pm, Sala de Puerto Rico. Refreshments.

Spring Craft Sale
Technology Matrons' sale includes: pottery, baked goods, toys, paintings, jewelry, knitted items, clothes and greeting cards, all hand made. Thurs, May 3, 8am-4pm, under the dome in Bldg 10.

Seminars and Lectures

Wednesday, April 25

Stability of Non-Isothermal Flow Between Closely Spaced Flat Plates
Prof. J. R. A. Pearson, chemical engineering, Imperial College, London. Polymer Processing Seminar Series. 12n, Rm 12-142.

Language and Thinking in Children
Dr. Mimi Sinclair-DeZwaart, Piagetian scholar, University of Geneva. Education Division Colloquium. 12n, Rm 9-150.

Conversations with the Soviet about European Security
Prof. Lincoln Bloomfield, political science, MIT. CIS Luncheon Seminar. 12:30-2pm, Rm E53-482. Bring your own lunch.

Future Directions of Dental Caries Research
Dr. Basil G. Bibby, Eastman Dental Center, Rochester. Oral Science Seminar. 3pm, Rm 18-301.

***The Fly's Eye*: A Two-Dimensional Position-Sensing Thermal Neutron Detection System**
J. B. Davidson, Oak Ridge National Lab. Nuclear Engineering Seminar. 3:30pm, Rm NW12-222. Coffee, 3pm.

New Results from the Hydrodynamical Model of Particle Production
Prof. P. Carruthers, Cornell University. Physics Joint Theoretical Seminar. 4pm, Rm 6-120. Coffee, 3:30pm, CTP Seminar Room.

Studies Directed Toward the Synthesis of Alkaloids and Terpenes
Prof. T. Ross Kelly, Boston College. Organic Chemistry Seminar. 4pm, Rm 4-270.

The Human Import of Science
Prof. Huston C. Smith, philosophy, MIT. Respondents: Harvey G. Cox, Harvard Divinity School and Baruch A. Brody, philosophy, MIT. Technology and Culture "Images of Man" Series. 5:15pm, Rm 9-150.

Composite and Carbon Fibers
Dr. Lawrence Peebles, Office of Naval Research. Chemical Engineering Faculty Lecture. 7:30pm, Stu Ctr West Lge.

Thursday, April 26

Programmable Assembly Machines
Prof. David E. Whitney, mechanical engineering, MIT. Production, Automation and Manufacturing Seminar. 3:30pm, Rm 37-212.

Applications of Electron Microscopy to Ceramic Research
Prof. J. D. Vander Sande, MIT. Ceramic Seminar. 4pm, Rm 31-161. Coffee, 3:40pm.

Construction of Turbulent Solutions of Navier-Stokes Equations
Dr. J. Bass, mathematics, University of Paris VI. Applied Mathematics Seminar. 4pm, Rm 2-338. Coffee, 3:30pm, Rm 2-349.

Earth Resources Technology Satellite, I
Dr. Nicholas Short, Goddard Space Flight Center, NASA. Tau Beta Pi Seminar. 4pm, Rm 6-120.

Interdepartmental Acoustics Seminar
Dr. Mark Moffett, University of Rhode Island, will speak. 4pm, Rm 3-370. Coffee, 3:30pm, Rm 1-114.

Investigation of Dust in Diseased Lung Tissues
Leopoldo Lopez-Escobar, MIT. Analytical Chemistry Seminar. 4pm, Rm 8-105.

What's Wrong with the Boltzmann H Theorem?
Prof. Joseph H. Keenan, mechanical engineering, MIT. Thermodynamics Seminar. 4pm, Rm 3-343. Coffee.

A Model of Urban Politics
Prof. Irma Adelman, International Bank for Reconstruction and Development. Graduate Economics Seminar. 4:30pm, Penthouse Sloan Bldg.

Radar Exploration of the Planets
Prof. Gordon H. Pettengill, earth and planetary science. Physics Colloquium. 4:30pm, Rm 26-100. Coffee, 4pm, Rm 26-110.

Surrealism Reconsidered
Whitney Chadwick, visiting lecturer, art history. Festival of the Surreal–Art History Seminar. 7:30pm, Rm 9-150.

Friday, April 27

Stability of the Fiber Spinning Process
Prof. J. R. A. Pearson, chemical engineering, Imperial College, London. Polymer Processing Seminar Series. 12n, Rm 12-142.

Dynamic Systems Defined on Groups: Structural Properties and Estimation
Allan Willsky, aero/astro. Aero/Astro Doctoral Seminar. 1pm, Rm 33-206.

Results on Argon and Krypton UV Lasers
Dr. Charles K. Rhodes, Lawrence Livermore Lab. Physics Seminar. 1:30pm, Rm 3-133.

Chemical Engineering 10.992 Seminar
S. Rose, "The Effects of Texturing on the Dyeability of Synthetic Fibers;" **G. Chiu**, "Counterdiffusion of Liquid Hydrocarbons in H-Mordenite–Effect of Silica-Alumina Ratio and Particle Size Distribution." 2pm, Rm 10-105.

Proposed Research Program at TRIUMF
Prof. David Measday, University of British Columbia. Medium Energy Physics Seminar. 2pm, CTP Seminar Room.

New Developments in Static Fluid Motors and Gas Expanders
Prof. Henry M. Paynter, mechanical engineering, MIT. Mechanical Engineering Seminar. 3pm, Rm 3-270.

Experiments on the Extraordinary Phases of He
Prof. John Wheatley, physics, University of California, San Diego. Materials Science Colloquium. 4pm, Rm 9-150.

Saturday, April 28

Symposium on Black Brazil
Discussions will include **Michael Mitchel**, political science, MIT, speaking on "Black Political Organizations in Sao Paulo, Brazil." 9:30-11am, 2-4pm, Boylston Hall, Harvard.

Monday, April 30

High Speed Videography
C. E. Miller, electrical engineering, MIT. Electrical Engineering Seminar. 12n, Rm 10-275.

Stability of the Film Making Process
Prof. J. R. A. Pearson, chemical engineering, Imperial College, London. Polymer Processing Seminar Series. 12n, Rm 12-142.

A Strategy for Science Education in the 1970's
Prof. Dorothy Zinberg, sociology, Harvard. Technology and Culture Seminar Science Luncheon, 12n, Dining room 3, Student Center. Lunch $2.

Nuclear Engineering 22.911/22.912 Doctoral Seminars
P. Carajilescov, "Velocity Field in a Bare Rod Bundle: Theory and Measurements;" **J. Castresana**, "Kinetic Theory of Mixtures." 3pm, Rm NW12-222.

Aquatic Ecosystems
Prof. Fred E. Smith, Harvard School of Design. Water Resources & Hydrodynamics Seminar. 4pm, Rm 48-316. Coffee, 3:30pm, Rm 48-424.

Fracture Mechanisms of Drawn Oriented Crystalline Polymers
Dr. Anton Peterlin, director, Camile Dreyfus Lab. Polymer Mechanical Behavior Seminar. 4pm, Rm 3-133.

Radiation Defect States at Practical Temperatures
Prof. Arden Bement, metallurgy and materials science, MIT. Physical Metallurgy Seminar. 4pm, Rm 13-2101.

Scroll Shaped Waves in an Excitable Three-Dimensional Medium
Arthur T. Winfree, biological sciences, Purdue. Applied Mathematics Colloquium. 4pm, Rm 2-338. Coffee, 3:30pm, Rm 349.

How To Build a Planet
Poul Anderson, sci fi author. LSC Lecture. 8pm, Rm 26-100. Lecture will be broadcast on WTBS 88.1 FM.

Tuesday, May 1

The Lesson of the Master: The Teachings of Patrick Geddes
Lewis Mumford, visiting professor. Urban Studies and Planning Seminar. 3pm, Rm 9-150.

Maturing and the Educational Process
Prof. Douglas H. Heath, psychology, Haverford College. Student Committee on Educational Policy Seminar. 3pm, Kresge Little Theatre.

Ballooning
Constance Wolf, famous balloonist. Aero/Astro General Seminar. 4pm, Rm 33-206. Coffee, 3:30pm, Rm 33-411.

Controlling Waves from Boundaries
Prof. T. L. Johnson. Electrical Engineering Coffee Hour. 4pm, Rm 10-105. Coffee, 3:30pm.

The Formation of Stratospheric Aerosols
Prof. James P. Friend, meteorology and oceanography, NYU. Meteorology Seminar. 4pm, Rm 54-100. Coffee, 3:30pm, Rm 54-923.

Maritime Administration Plans and Policy
Dr. Joseph Kasputys, director, Office of Plans and Policy, Maritime Administration, Washington. Ocean Engineering Seminar. 4pm, Rm 3-446. Coffee, 3:30pm.

UV Spectra from the Copernicus Satellite
Dr. Edward B. Jenkins, Princeton Observatory. Astrophysics Colloquium. 4:15pm, Rm 37-252. Coffee, 4pm.

Synthetic Organic Chemistry
Prof. Teruaki Mukaiyama, Karl Pfister visiting professor. Chemistry Seminar. 5pm, Rm 4-270.

Wednesday, May 2

Modelling the Performance of a Single Screw Plasticating Extruder
Prof. J. R. A. Pearson, chemical engineering, Imperial College, London. Polymer Processing Seminar Series. 12n, Rm 12-142.

Pharmacokinetics and Cell Kinetics in Cancer Chemotherapy
Prof. Kenneth Bischoff, chemical engineering, Cornell. Chemical Engineering Seminar. 2pm, Rm 10-105.

Xenon Oscillations in Large Pressurized Water Reactors
W. R. Corcoran, combustion engineering. Nuclear Engineering Seminar. 3:30pm, Rm NW12-222. Coffee, 3pm.

Recent *in vitro* Studies on Bone Resorption
Dr. Paul Goldhaber, dean, Harvard School of Dental Medicine. Oral Science Seminar. 3pm, Rm E18-301.

Wind Load Design Based on Statistics
Prof. A. M. Hasofer, mathematics and statistics, University of New South Wales. Civil Engineering–Structural Safety Theory Seminar. 4pm, Rm 1-353.

Thursday, May 3

New IBM System/370 Capabilities: Multiprocessing and OS/VS2 Release 2
Robert Daley, information processing services; **Arnold Miller** and **Don Mitchell**, IBM. Information Processing Services Seminar. 3pm, Mezzanine Lounge Stu Ctr. Coffee, 2:30pm.

New Developments in Materials Processing
Prof. N. P. Suh, mechanical engineering, MIT. Production, Automation and Manufacturing Seminar. 4pm, Rm 37-212.

The Unique Extensive Time-Invariant of Quantum Mechanics: Energy Minus Available Work
Prof. Elias P. Gyftopoulos, nuclear engineering, MIT. Thermodynamics Seminar. 4pm, Rm 3-343. Coffee.

Future Trends in Food Industry Research
Dr. E. J. Briskey, Campbell Institute for Food Research, Camden. Nutrition and Food Science Seminar. 4:15pm, Rm 54-100. Coffee, 4pm.

Ionicity of the Chemical Bond in Crystals
Dr. James C. Phillips, Bell Telephone Labs. Physics Colloquium. 4:30pm, Rm 26-100. Coffee, 4pm, Rm 26-110.

An Exploration in the Foundations of Economic Analysis: Labor Market Structure
Thomas Vietoriez and **Bennett Harrison**. Graduate Economics Association. 4:30pm, Sloan Penthouse.

Synthetic Organic Chemistry, II
Prof. Teruaki Mukaiyama, Karl Pfister visiting professor. Chemistry Seminar. 4pm, Rm 4-270.

Friday, May 4

Extensional Rheology of Highly Elastic Materials
Prof. J. R. A. Pearson, chemical engineering, Imperial College, London. Polymer Processing Seminar Series. 12n, Rm 12-142.

What Are Models Made Of?
Dr. David Hawkins, philosophy, University of Colorado. Education Division Colloquium. 12n, Rm 9-150.

Two-Photon Spectroscopy Using I-R Lasers
Dr. Sam Freund, National Bureau of Standards. Physics Seminar. 1:30pm, Rm 3-133.

Chemical Engineering 10.992 Doctoral Seminars
A. Jeje, "Transient Pool-Boiling-Heat Transfer Between Immiscible Liquids"; **M. Manning**, "Bosch, Bosch, Where Are You?", 2pm, Rm 10-105.

Flow in Lungs
Dr. Marc J. Jaeger, J. Hillis Miller Health Center, University of Florida. Mechanical Engineering Seminar. 3pm, Rm 3-270. Coffee, 4pm, Rm 1-114.

Quasi-One-Dimensional and Quasi-Two-Dimensional Magnetic Materials: Crossover and Scaling Phenomena
Dr. Luke L. Liu, physics, MIT. Materials Science Colloquium. 4pm, Rm 9-150. Coffee, 3:30pm.

MIT Club Notes and Meetings

Auto Club
Regional race. Sat, Apr 28, 8:15am-5pm, Lime Rock, Conn. You must contact David Ziegelheim, X8510 Dorm, if you wish to attend.

Bridge Club
ACBL Duplicate Bridge. Thurs, 7pm, Student Center Rm 491. No card fees if under 5 tables.

Chess Club
Sat and Sun, 1:30-5:30pm, Student Center Rm 473.

Classical Guitar Society
Classes, group or private. Mon & Thurs, 5-8pm, Rm 1-132, 134, 136; Sat, 8am-12n, Rm 5-231, 232. Vo Ta Han, 494-8353.

Ergo
Staff meeting. Sun, 7pm, Student Center Rm 443.

Goju Karate Club*
Open to the Cambridge Community. Mon, Wed, Fri, 7:30pm, Stu Ctr Rm 407. Call 253-2018.

Hobby Shop**
Mon-Fri, 10am-6pm, Rm W31-031. Fees: $6/term for students; $10/term for community. Call X3-4343.

Judo Club**
H. Yanagi, 5th degree black belt, chief instructor. Mon, Wed, Fri, 5-6:30pm; Sat, 1-3pm; duPont Exercise Rm. M. Portnoff, X3-5954.

Kung Fu Club**
Northern Praying Mantis. Tues, Thurs, 7-9pm, T-Club Lge. H.C. Wong, 876-5071.

MIT Wheelmen**
All aspects of bicycles and bicycling discussed, events planned, advice and help given. Thurs, 7:30pm, Rm 1-246. Call Harry, X3-2384.

MIT/DL Duplicate Bridge Club**
Tournament, Tues, May 1, 6pm, Stu Ctr Rm 473.

Rugby Club**
Practice sessions; Tues, Thurs, 5pm Briggs Field; Sat, 1pm, meet in DuPont Gym.

Student Homophile League*
Meeting and coffee hour. Sun, 4-6pm, Rm 14E-307. All men and women welcome. For gay help (anonymous) at MIT, call student gay tutor, 492-7871, anytime.

Science Fiction Society*
Fri, 5pm, Rm 1-236.

Scuba Club
Pool session, Wed, Apr 25, 8pm, Alumni Pool. Compressor hours, Mon & Fri, 4-6pm, Alumni Pool.

Strategic Games Society
Sat, 1pm, Walker Rm 318. Club offers opponents and discounts on merchandise to members plus gaming periodicals library. Kevin Slimak, X0389 Dorm.

Student Information Processing Board Meeting*
Mon, 7:30pm, Rm 39-200.

Tae Kwon Do Club
Tues, Thurs, 5-7pm; Sat, 11am-1pm. duPont T-Club Lounge. Call Jae Kim, X9212 Dorm.

Tech Engineering News**
General staff meeting, Sun, 5pm, Rm W20-453.

Technique
Staff meetings. Sat, 11am, Student Center Rm 451.

Tech Squares***
Western style square dancing. Tues, 8-11pm, Sala de Puerto Rico. Admission: $1, first time free.

Tiddlywinks Association*
Wed, 8pm, Student Center Rm 491.

Unicycle Club*
Activities and beginners' session, Sun, 1pm, in front of Student Center.

Community Meetings

Student Committee on Educational Policy
Meeting on year round operations. Wed, Apr 25, 8pm, Stu Ctr Rm 407.

MIT Faculty Club
Italian Nite dinner. Fri, Apr 27, 6:30pm, Faculty Club. $6.50.

Technology Wives Spring Banquet
Dr. Mary Potter Rowe will speak. Sat, Apr 28, 12n, Aquarium Restaurant. Lunch $3.60.

Women's Forum
Guerrilla theater. First presentation of consciousness-raising skits for the Forum. Mon, Apr 30, 12n, Rm 10-105.

Honorary Matrons Spring Luncheon
Wed, May 2. Sherry hour, 12:15pm; lunch, 1pm. Stud Ctr West Lge. lunch, 1pm.

Student Committee on Educational Policy
Meeting on SCEP. Wed, May 2, 7:30pm, Stu Ctr Rm 400.

MIT Pistol and Rifle Club**
Course in basic pistol marksmanship begins Thurs, May 3, 6:30-8:30pm, duPont Pistol Range. Limited to first 20 adult applicants. Fee $10. Call Range Master, Thomas McLennan, X3-3296.

Wellesley Events

Endgame
Wellesley College Theatre directed by Herbert Propper. Fri-Sun, Apr 27, 28, 29, 7:30pm, Alumnae Hall Ballroom.

Social Events

Friday Afternoon Club**
Music, conversation and all the cold draft you can drink. Fri, 6pm, the Thirsty Ear, Ashdown basement. Admission: $1 men, 50 cents women. Must be over 18.

Muddy Charles Pub**
Join your friends for music, beer, wine, snacks, conversation at the Muddy Charles Pub, 110 Walker. Hours: Mon-Fri, 11:30am-2pm and 4-7:30pm; Sat, 7-12pm. Nightly specials will include: Mon, all wines 25 cents; Tues-Thurs, free pretzels and chips. Call GSC, X3-2195.

SCC Pot Luck Coffeehouse*
Live entertainment Fri-Sat, 8:30pm-12m. Student Center Mezzanine Lounge. Free coffee, cider, doughnuts. Sponsored by Student Center Committee. Volunteers to perform or otherwise help out, call Paul Mailman, X9626 Dorm, or Doug Fried, X8767 Dorm.

Movies

Film and Lecture Series
Architecture 4.097. **Pauline Kael**, film critic for *The New Yorker*, will speak. Wed, Apr 25, 2pm, Rm E21-010. Followed by screening of **The Lady Eve**, 7pm, Rm 21-010

Marat Sade
Humanities 21.025. Wed, Apr 25, 7pm, Rm 10-250.

Member of the Wedding
Humanities 21.316. Wed, Apr 26, 9pm, Rm 10-250.

Beauty and the Beast (Cocteau)
Humanities 21.317. Thurs, Apr 26, 7pm, Rm 10-250.

Ryan's Daughter
LSC. Fri, Apr 27, 6pm & 10pm, Kresge. Tickets 50 cents, MIT/Wellesley ID.

Dial 'M' for Murder
Student Center Committee Midnight Movie Series. Fri, Apr 27, 12m, Sala de Puerto Rico. MIT/Wellesley ID.

Everything You Always Wanted to Know about Sex
LSC. Sat, Apr 28, 7 & 9:30pm, Kresge. Tickets 50 cents, MIT/Wellesley IDs.

Four Feathers (1939)
LSC. Apr 29, 7pm, Rm 10-250. Tickets 50 cents, no IDs.

Cleo From 5-7
Humanities 21.317. Mon, Apr 30, 7pm, Rm 10-250.

Spies (Lang)
Humanities 21.209. Tues, May 1, 7pm, Rm 10-250.

Film and Lecture Series
Architecture 4.097. **Stan Brakhage**, experimental filmmaker will lecture and show his films. Wed, May 2, 2pm and again at 7pm, Rm E21-010.

Bringing Up Baby and The Thin Man
Humanities 21.012. Wed, May 2, 7pm, Rm 10-250.

Portnoy's Complaint
LSC. Fri, May 4, 7pm & 9:30pm, Rm 26-100. Tickets 50 cents, MIT/Wellesley ID.

The Bank Dick
Student Center Committee Midnight Movies. Fri, May 4, 12m, Sala de Puerto Rico. MIT/Wellesley ID.

Music

Noonhour Concert*
The Cambridge Symphonic Brass Ensemble. Thurs, Apr 26, 12n-1pm, Chapel. Free.

Sitar Concert
Sangam presents a sitar recital by Miss K. Sanyal accompanied by Sharda Sohay on tabla. Sat, Apr 28, 2pm, Kresge. Admission: $2 and $1.

MIT Women's Chorale Concert
Performing works by Bach, Handel, Mozart and Mendelssohn. Sun, Apr 29, 3pm, Chapel. Free.

Noonhour Concert
Music by Mozart for Winds; trio, sextet and octet. Thurs, May 3, 12n, Chapel. Free.

Glee Club
Rehearsals. Works by Mozart and Schubert. Tues, Wed, Thurs, 5pm, Kresge.

Theater and Shows

The Playboy of the Western World
MIT Dramashop will present J. M. Synge's Irish comedy. Directed by Joseph D. Everingham. Thurs-Sat, Apr 26-28, Little Theater, Kresge Auditorium. Admission $2.25. Reservations, 9am-5pm, 253-4720.

Dance

Dance – Free
Social Action Coordinating Committee presents a multi-media happening with creative dance, yoga and chanting. Fri, Apr 27, 7:30pm, Sala de Puerto Rico. Donation $1. Public invited with student or dance free ID.

Six Easy Pieces
Presented by the Dance Workshop. Sat, Apr 28, 8:30pm, Pot Luck Coffeehouse.

Dance Workshop
Courses in Modern, Afro-American and M/J/B dance. For information Chris Peterson, 492-6983.

Folk Dance Club*
International, Sun, 7:30-11pm, Sala. **Balkan**, Tues, 7:30-11pm, Student Center Rm 491. **Israeli**, Thurs, 7:15-10:15pm, duPont T-Club Lounge. **Afternoon dance break**, Fri, 12:30-1:30pm, Bldg 7 Lobby.

Yoga Class
Beginners class. Fri, 5:45pm, Bldg 10-340. For information, call, Ei Turchintz, 862-2613.

Kundalini Yoga
Classes: beg, Mon & Fri, 1pm, duPont Wrestling Room, Tues & Thurs, 3pm, McCormick Green Lge; intermed, Mon, 6:30pm, McCormick Green Lge. Enis Singh Vlug, 436-3753.

Exhibitions

Fritz Scholder's Paintings and Lithographs of American Indians
Hayden Gallery and Hayden Corridor Gallery. April 13-May 5. Hayden Gallery is open 10am-4pm, Mon-Sat; Corridor Gallery is open all the time.

Photo Exhibit
Photographs by graduate students in Minor White's photography course. Creative Photography Gallery (120 Mass Ave) Apr 23 thru May 5, open daily 10am-6pm.

Music Library Exhibit
Photographs of early instruments up to 1600. Daily, Rm 14E-109.

Hart Nautical Museum*
Exhibits include "Ocean Engineering Summer Laboratory Projects 1971 and 1972," and "Tugs and Towing." Bldg 5, first floor.

Athletics

Outdoor Track
Tufts. Wed, Apr 25, 3pm, Briggs Field.

Women's Tennis
Emmanual. Wed, Apr 25, 3:30pm, duPont Tennis Court.

V Baseball
Lowell Tech. Thurs, Apr 26, 3pm, Briggs Field.

V Lacrosse
U.N.H. Thurs, Apr 26, 3pm, Briggs Field.

JV/F Baseball
Bryant & Stratton. Fri Apr 27, 3pm, Briggs Field.

Outdoor Track
WBI and Bates. Sat, Apr 28, 12:30pm, Briggs Field.

Rugby
University of Rhode Island. Sat, Apr 28, 1pm, Briggs Field.

JV/F Lacrosse
Harvard. Sat, Apr 28, 2pm, Briggs Field.

F & V Tennis
Trinity. Sat, Apr 28, 2pm, duPont Tennis Courts.

WV Sailing
Gerry Reed Trophy. Sun, Apr 29, 11:30am, Sailing Pavilion.

V Baseball
Northeastern. Wed, May 2, 4pm, Briggs Field.

V Lacrosse
Harvard. Wed, Apr 2, 4pm, Briggs Field.

F Lt Crew
Tabor Academy. Wed, Apr 2, 4:30pm, Pierce Boat House.

V Baseball
Bates. Fri, May 4, 4pm, Briggs Field.

Religious Services and Activities

The Chapel is open for private meditation from 7am to 11pm every day.

Campus Crusade for Christ/College Life*
Family time, fellowship and teachings from God's Word. Fri, 7-9:30pm, Rm 1-132.

Christian Bible Discussion Group*
Thurs, 1pm, Rm 20B-031. Call Prof. Schimmel, X3-6739, or Ralph Burgess, X3-2415.

Christian Study Group
Meeting to study God's Word and the lives of Christian men. Sun, 9:30am, McCormick Green Room. For information, 494-8778.

Christian Science Organization*
Rob Nelson from the Christian Science Center will speak on "How Christian Science Heals." Thur, Apr 26, 4pm, Rm 1-236. Tues, 7:15pm, Rm 8-314. Meetings include testimonies of healing.

Divine Light*
Discourses on the knowledge of Shri Guru Maharaj Ji. Mon, Wed, Fri, 7:30pm, Rm 4-159.

Hillel Services*
Mon-Fri, 8am, Rm 7-108; Fri, 8:15am, Chapel; Sat, 9am, Chapel.

Hillel Classes
Hebrew, Wed: Beg 6pm; Intermed 5pm, Rm 1-203; Adv 1pm, Rm 5-231. **Basic Judaism**, Kathy Green, Wed, 8am, Hillel Library. **Yiddish**, Thur, 7pm, Rm 1-242. **Mekhilta** lectures, Fri, 12n, Hillel Library. **Talmud**, Beg, Mon-Tues, 8pm; Adv, Sun, 12n, Wed, 8pm.

Islamic Society*
Prayers, Fri, 12:15pm, Kresge Rehearsal Rm B. Discussions on the Qur'anic interpretations of various aspects of life, Sat, 4pm, ISC Lounge, Walker 2nd floor, coffee served.

Protestant Worship Service*
Sun, 11am, Chapel.

Roman Catholic Masses
Masses: Sun, 9:15am, 12:15pm, 5:15pm; Tues, 5:05pm; Wed, 4:30pm; Fri, 12:05pm. Chapel.

Vedanta Society*
Services, Fri, 5:15pm, Chapel. Followed by discussion hour, 5pm, Lobdell Dining Room.

Westgate I & II Bible Study
Wed, 8pm, Westgate I, apt 1202. For information, 494-8405 or 494-8778.

United Christian Fellowship*
Christians for dinner, food, fellowship. Wed, 5pm, Walker (at sign of the fish). Followed by singing, praying, sharing meeting, 6pm, Rm 14E-303.

Zen Society*
Meditation meetings. Mon through Fri, 8-9am, Chapel. Call 492-4945.

Announcements

Transfer Student Orientation Committee Meeting
Mon, Apr 30, 6pm, Student Center Mezzanine Lounge.

The Big Screw Contest
Vote for the professor most deserving. Proceeds to go to charity. Final balloting, Fri, May 4 at Kaleidescope.

Softball Games
The Campus Patrol challenges any Dorm or Fraternity to a game of softball. Contact: Officer Elderd, X3-2997.

Wellesley-MIT Exchange
Applications for the Fall '73 term are due Fri, May 4. Applications and information are available at the Information Center, Rm 7-111, and the Exchange Office, Rm 7-101.

Summer Work Permission for Foreign Students
The immigration authorities have extended permission to grant summer employment to foreign students. Application forms may be obtained from Mrs. Ellen Lacroix, Foreign Students Office, Rm 3-107.

Dormitory Council R/O Planning
Volunteers are needed to help out during the 10 days prior to fall registration day. If you are returning early and would like to assist at the inter-dorm level, please contact Bob Greenberg, X8539 Dorm.

Dining Service

Wed, Apr 25
Lunch: Chicken loaf w/a la king gravy
Dinner: Saurbraten–Bavarian Night
Thurs, Apr 26
Lunch: Swedish meatballs over noodles
Dinner: Breaded pork chop w/applesauce
Fri, Apr 27
Lunch: Cheese souffle w/tomato sauce
Dinner: Shrimp and Halibut Mariner
Mon, Apr 30
Lunch: Brunswick chicken stew
Dinner: Roast veal w/rice pilaf and gravy
Tues, May 1
Lunch: Manicotti w/italian sauce
Dinner: Hungarian goulash over noodles.

Freshmen are encouraged to attend departmental lectures and seminars. Even when these are highly technical they provide students one means to learn more about professional work in a department and field.

* Open to the public
** Open to the MIT community only
*** Open to members only

Send notices for May 2 through May 11 to the Calendar Editor, Room 5-111, Ext. 3-3279, before noon Friday, April 27.

New UROP Listings

For more detailed information on UROP opportunities listed, MIT undergraduates should call or visit the Undergraduate Research Opportunities Program Office, Room 20B-141, Ext. 3-5049 or 3-4849. Undergraduates are also urged to check with the UROP bulletin board in the main corridor of the Institute.

Massachusetts General Hospital Boston, Mass.

A research laboratory of the neurosurgical service at the MGH is looking for a student to participate in a study of the chemistry and neurophysiological function of the mammalian retina. The lab is studying the effects of neurotransmitters which facilitate communication between nerve cells on retinal function.

The procedure of the experimentation consists of removing the retina from a rabbit eye, incubating the retina in an artificial medium which allows it to continue to function, recording the electrical activity of the retinal ganglion cells and observing the effects of adding neurochemicals to the perfusate or of changing its electrolites on ganglion cell response to light.

Interested students should contact the UROP office, Room 20B-141, Ext. 3-5049.

STOP! UROP summer money is fully committed.

REPORT BY CEA DIRECTOR

Accelerator to End High Energy Physics Operations

The following report on the Cambridge Electron Accelerator was made April 10 to the Harvard Faculty of Arts and Sciences by Karl Strauch, professor of physics at Harvard and director of the accelerator. The accelerator, which cost $12 million, was opened in September, 1962, and is operated jointly by Harvard and MIT with funds provided by the Atomic Energy Commission.

The Cambridge Electron Accelerator is ceasing operation for high energy physics sometime before June 30, 1973, and will very probably shut down for good at that time. I would like to read excerpts from the formal announcement sent to Presidents Bok and Wiesner by Dr. English, the Assistant General Manager for Research of the Atomic Energy Commission:

> The US Atomic Energy Commission has decided with deep regret to terminate operation of the Cambridge Electron Accelerator (CEA) for high energy physics research. It is planned to cease operating the CEA at the end of the current experimental run and to complete the closeout of AEC support of the Laboratory during FY 1974. This decision is reflected in the FY 1974 budget presently before the Congress. We have had extended discussions over the past months with Professor Karl Strauch, the Director of CEA, and he is aware of this decision.
>
> "The conversion and operation of the accelerator as a colliding beams device which have been the sole activities at CEA since June 1, 1970, have been successful. The experiments on electron-positron scattering have extended the region of established validity of the theory of quantum electrodynamics. The data showing the unexpectedly large pion production rate are scientifically very exciting. The analysis of the various beam instabilities encountered by the CEA in its development of a colliding beams capability, and the techniques developed for studying and preventing these instabilities have proven invaluable at other colliding beams devices. However, the rapid completion and highly successful initial operation of the much higher intensity colliding beams device (SPEAR) at the Stanford Linear Accelerator Center make it unreasonable in these times to continue further operation of the CEA.
>
> "It is the intention of the AEC to continue to provide support (independent from CEA) for the ongoing AEC-funded high energy physics research programs at MIT and Harvard at about the current levels."

In order to understand the reasons and implications of this decision it is necessary to very briefly outline the role that the accelerator has played in the Cambridge high energy physics community.

The accelerator was designed, built and operated jointly by Harvard and MIT under contract with the AEC. Funds for its construction ($11.5 M) and operation (the yearly budget varied from $6.2 M in 1965 to $2.0 M in 1973) were provided by the AEC. The scientific and technical direction was entirely the responsibility of the University and the Institute.

The purpose of the laboratory was to conduct pure research in high energy physics; no classified work was to be carried out, and none has been performed. The administrations of the University and of the Institute gave full and invaluable support to the laboratory.

Construction was started in 1957; CEA was the first electron accelerator to use the principle of strong focusing of which Professor Livingston, the first director, was one of the co-discoverers. When completed in 1962, the accelerator was the highest energy electron accelerator in the world. It served as a prototype for accelerators in England, Germany and the Soviet Union. Between 1962 and 1970 CEA contributed greatly both to our understanding of the electromagnetic aspects of particle physics and to development of accelerator physics and technology. Scientific highlights were the first direct proof of the close relationship between photons, the particles of the electromagnetic field, and the π meson, one of the short-lived strongly interacting particles; accurate measurements of the charge and current distributions in the proton and neutron; the production with unpolarized and polarized photons of several types of mesons; the creation of excited states of the proton with electrons.

There were setbacks—an explosion in 1965 which severely damaged the experimental hall and killed one technician; the physics program was interrupted for a period of eight months.

When the CEA was planned and built, only two large accelerator laboratories operated in the US—Brookhaven and Berkeley. Cambridge, Cornell and Princeton became additional facilities, smaller in scale, but more closely tied to universities. By 1970 the situation had changed radically. To Berkeley and Brookhaven were added Argonne and Stanford. And the $250 M National Accelerator Laboratory was rising and swallowing a larger and larger fraction of the funds earmarked for high energy physics. CEA was no longer unique, and most of its work could be done elsewhere. For FY 71 the AEC decided to cut funds for CEA by 30 percent. As a result our staff had to be cut from 180 to 123 people. Only unique developments in colliding beam technology saved the laboratory from the fate of the Princeton Accelerator which was told to close down at that time. Our work since 1970 was described in the letter of Dr. English which I read at the beginning of the statement.

I have outlined this history to explain why the decision to close down CEA at this time, however painful, does not come as a surprise. In more prosperous times the accelerator might have operated for high energy physics for a few more years. But there is no question that it has reached accelerator-old-age and that its days were numbered. This fact, however, does not reduce the painfulness of the close-down, particularly for its dedicated staff of technicians, engineers and physicists. The successes of the laboratory were due to the imagination, devotion and hard work of this staff. They, more than any other group, deserve the recognition and gratitude of the community.

Having a good idea of what was coming, the CEA staff was reduced by attrition to 83 by March 15, 1973. At that time we had to give termination notices to 45 S&W employees as of June 30, 1973, keeping 22 people for at most another year for close-down activities. In cooperation with Harvard and MIT Personnel Departments we are making every effort to help in the relocation, and we are hopeful that, as in 1970, every employee who wants a job will obtain one. It must be stated, however, that only a fraction of the people affected can expect to have their first choice, that is, to find similar positions at Harvard or MIT.

CEA, having reached old age for high energy physics, is still young as one of the most powerful sources of x-rays in the world. A group of solid-state physicists, biologists, chemists and astronomers, under the leadership of Professor William Paul, have made a proposal to NSF to run the accelerator as a synchrotron radiation facility. While no completely final decision has yet been reached, approval is very unlikely for purely financial reasons. If, as expected, the NSF proposal is rejected, this decision will represent a real loss to the US and local scientific community.

In closing, let me give two sets of numbers to illustrate the important role played by CEA in the local high energy physics program. A total of 72 PhD theses were directly based on work done at CEA: 37 from Harvard, 27 from MIT, 2 from Tufts, 4 from Northeastern, 2 from Yale. One hundred and twenty members of local physics departments were associated with the CEA high energy physics program between 1962 and 1973.

It was great that the AEC enabled us to have a local accelerator center, and the Commission deserves our gratitude both for this fact and the manner in which it made this possible. Since 1970, many of the physicists who worked at CEA have learned to travel to other accelerators; from now on all of us will have to do this. Life will become more difficult and less efficient; but high energy physics is as exciting and important a subject as ever, and physicists from Harvard and MIT will continue to explore this field most vigorously.

MUSIC IN MAY

5 Groups to Give Concerts

MIT's Concert Band, Glee Club, Symphony Orchestra, Choral Society and Opera Workshop will present concerts in May. All will be in Kresge Auditorium under the sponsorship of the music faculty.

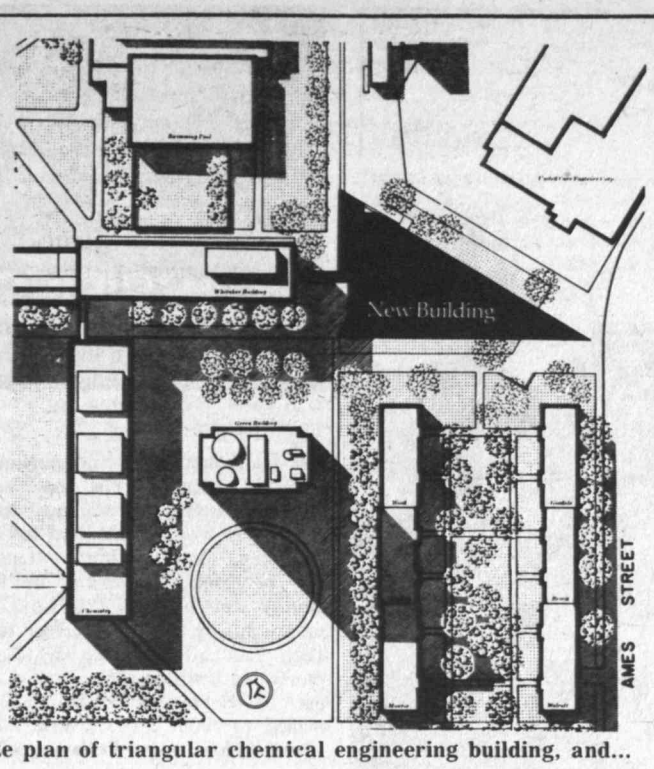
On May 5, The Concert Band, directed by John Corley, will present a free concert at 8:30pm. The program will include Schoenberg's Theme and Variation, Op. 43a, Jacques Casterede's Divertissement D'Ete and works by Henk Badings, William Schuman and Elie Siegmeister.

On May 6, the MIT Glee Club and the Elizabeth Rodman Vorhees Memorial Chape Choir of Douglas College will present a 3pm concert. The program, directed by John Oliver, will consist of Mozart's *Vesperae de Dominica* and Schubert's Mass in C Major. Free tickets will be available in the lobby of Building 10 for a week prior to the concert, and tickets priced at $1.50 will be available at the door.

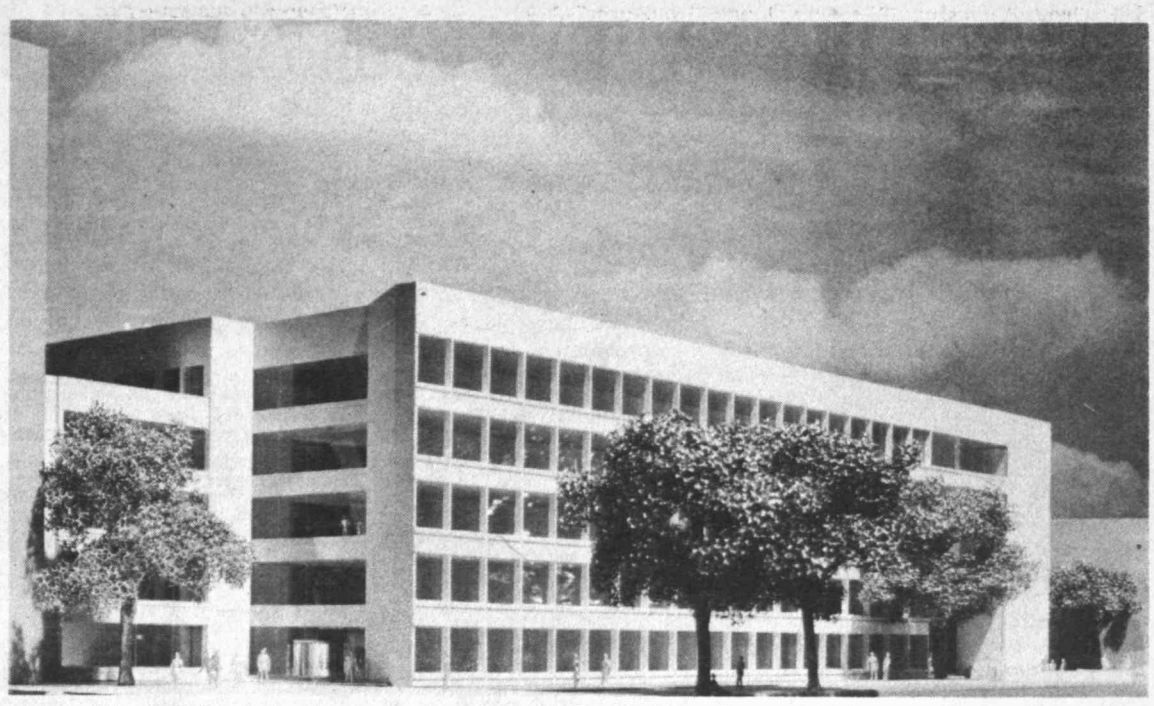
On May 12, the MIT Symphony Orchestra, conducted by David Epstein, will present an 8:30pm concert. The program will consist of Mahler's Fifth Symphony and Mozart's Overture to the Marriage of Figaro. Free tickets will be available in the lobby of Building 10 for a week prior to the concert and a limited number tickets priced at $1 will be available at the door.

On May 13, the Choral Society, conducted by John Oliver, will present a 3pm concert. The program will include Benjamin Britten's *Contata Miseri Cordium*, Schubert's Mass in G and works by Poulenc and Stravinsky. Soloists will be Susan Larson, Richard Burke and David Evitts. Tickets, available at the door, will be $3 for reserved seats, $2 for unreserved seats and $1 for students with ID cards. Reservations can be made by calling the Kresge Box Office, 253-4720.

On May 16, the newly formed MIT Opera Workshop, directed by John Cook, will present Mozart's Magic Flute **in English at 8pm. Soloists include Francis Hester, Rufus Hallmark, Sandra Stuart, Elias Roochvarg, Johanna Kovitz, Debbie Smith and Roberto Gaston. Tickets are $.50 and will be available at the door.**



Site plan of triangular chemical engineering building, and...



...View of the building from the southwest. The Whitaker Building is at the left.

Major Growth Indicated in Chemical Engineering

(Continued from page 1)

spring of 1975. The total project budget of $13.1 million includes $10.3 million for construction and associated costs and $1.8 million to cover maintenance costs for the first ten-year period.

Commenting on the National Sponsoring Committee, Mr. Johnson said, "The support of these industrial and business leaders in our planning for this vital project has greatly strengthened the Institute in maintaining a leading role in chemical engineering education and research.

"These men have emphasized the need for continuing innovation in fields of technological achievement vital to the betterment of our economic and social environment, and we at MIT value most highly their counsel and help."

Mr. Jamieson said, "When we began the capital campaign for this effort just over a year ago, we saw the clear need to complete its funding in a very short period, and MIT has devoted the effort to achieve a successful result. We look now to a concentrated campaign to conclude the funding within the weeks ahead. The early construction start which the success to date in the capital drive has made possible has resulted in significant economies in the total project budget. We are confident that the final cost will not exceed the goal of our campaign, and that the balance of the funding will shortly be secured."

The new building will provide 130,000 gross square feet of space for classrooms, laboratories, and offices in five stories above ground and two basement floors. It will be located at the center of the MIT campus on Ames Street, adjacent to the Whitaker Laboratories for biology and the life sciences and the East Campus undergraduate dormitories.

The new building site is adjacent to the departments of chemistry, biology, nutrition, food science and the earth sciences. The architect for the building is I.M. Pei, who designed two other buildings in the vicinity of this building, the Cecil and Ida Green Building for Earth Sciences, and the Camille Edouard Dreyfus Building for Organic Chemistry. Mr. Pei, an alumnus of MIT, was graduated from the School of Architecture in 1940.

The new chemical engineering building will consolidate the department's activities now located in seven facilities, six of which are at MIT and the seventh at the Children's Hospital Research Laboratories in Roxbury. The new facility will provide both additional space and modern facilities essential to advanced research in emerging fields in chemical engineering such as enzymes and medical technology.

According to Professor Raymond F. Baddour, who became fifth head of the Department in 1969, the department's projected expansion is based strongly on the increased importance of such interdisciplinary teaching and research.

"The single most important reason for the significantly increasing commitment to our profession by undergraduates and graduate students is a renewed interest in those activities on which the chemical engineer concentrates—fuel and energy, environmental problems, fertilizers and foods, pharmaceuticals, synthetic fibers, new building materials, applications of biological developments, and other problems of high social importance," he said.

The department's increase in faculty over the next six years is projected to nearly double the present teaching and research staff, from 25 at present to 44 in 1978. The student body is also increasing rapidly. Sophomore and junior enrollments in particular are increasing for the second year, and graduate student enrollment is up some 22 percent over two years ago to a current total of 148. The Department projects about a one-third increase in total student body from 265 at present to 380 in 1978.

Since founding chemical engineering as a discipline, MIT has remained a national leader in chemical engineering education. MIT consistently awards more graduate degrees in chemical engineering than any other college or university in the country. More than 10 percent of the nation's teachers of chemical engineering obtained one or more degrees from the department, and more than 10 percent of its 5,300 living alumni are presidents, vice presidents, owners or partners of industrial firms.

"The department's annual volume of sponsored research—currently at the level of about $1,000,000 and growing—makes a considerable contribution to research and development in chemical engineering here and abroad.

According to Professor Baddour, the new chemical engineering building will greatly increase MIT's capacity to respond to the renewed demand for highly trained chemical engineers.

"MIT is convinced of the long-term need because of further competitive growth of industry and technology, because of the widely projected growth of the chemical industry which will be based on both new and traditional fields of chemical engineering, and because of the leading role the chemical engineer will play in solving problems of such magnitude and importance as energy and environmental quality," he said.

"Chemical engineering is one of the obvious disciplines to which young men and women at MIT will turn to fulfill a strongly increasing interest in using technology to solve large-scale social problems."

Student Checks Braintree River Pollution

An MIT freshman, working under the auspices of the Undergraduate Research Opportunities Program, is studying pollution in the Monatiquot River in nearby Braintree.

He is 19-year-old Michael Bookman, of Braintree, a first-year student enrolled in the Experimental Studies Group (ESG). He initiated the project in 1971 while attending Braintree High School but, after entering MIT, proposed the project to UROP and was given support.

The Town of Braintree accepted the project as a means of determining the river's pollutants and their sources.

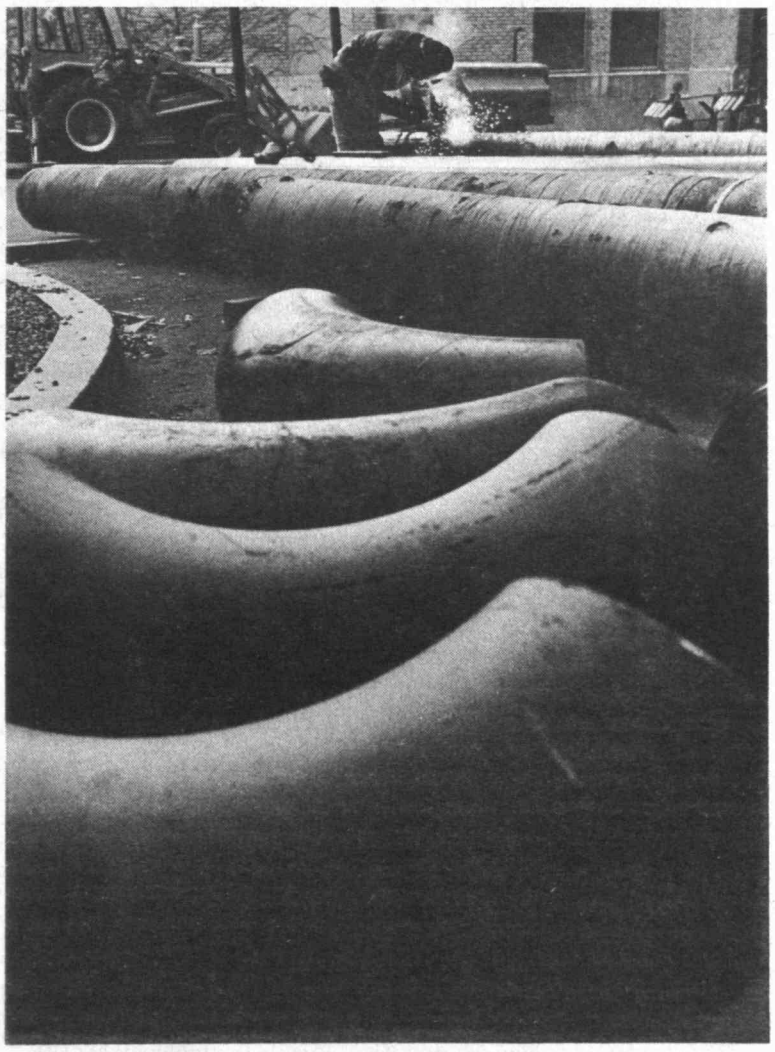
For his study Michael has borrowed an assortment of equipment from MIT laboratories and also has designed and assembled two portable monitoring stations for on-the-spot water analysis. His equipment includes a spectrophotometer, atomic absorption apparatus and specific electrodes for the analysis of inorganic pollutants, and a gas chromatography-mass spectroscopy-computer system for organic matter.

"Access to MIT's sophisticated apparatus, plus the freedom of time that ESG permits, allows me to monitor the pollutants effectively and at a relatively low cost," Michael said.

Every Tuesday Michael travels to Braintree High School where he meets with about 80 students in a biology class. "We discuss ecology, pollution and conservation. Some of them are turned on and have volunteered to help me with the river study," he said.

"The most optimistic finding so far," he said, "is that the river is virtually free of industrial pollution upstream from the Plain Street bridge. However, other sections of the river are heavily polluted. The major cause seems to be sewage and industrial waste."

Michael's river study fills an important gap. "At this time neither local, state nor federal agencies have the manpower to investigate the Monatiquot River to the detail required for positive action," he said. "I report to the Braintree Board of Health once a month and my data is used to help solve the problems."



A masked welder works on chilled water pipes that will tie the main group of campus buildings to the Institute's central refrigeration plant. The first area to be serviced by the new central air conditioning system will be the Medical Department in Building 11. —Photo by Margo Foote

Sitar Concert

MIT Sangam will sponsor a sitar concert on Saturday, April 28, at 2pm in Kresge Auditorium.

The recital will be given by Krishna Sanyal, a widely acclaimed female sitarist from India, and Sharda Guru, an exponent of the "Banarsi baj" style of tabla.

The concert is open to the public. Tickets are $1 and $2. For reservations call 354-6172.

Liepmann Host Of Music Show

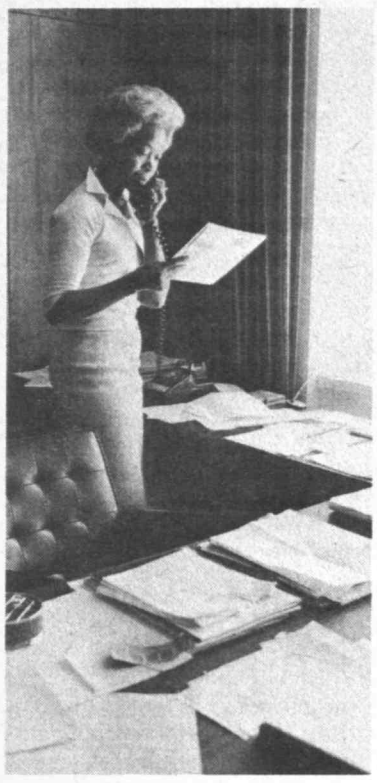
Klaus Liepmann, who retired as Director of Music at MIT in June, 1972, is host for a weekly music program on WGBH-FM radio.

The show, entitled "Notes on Music," is aired from 7:30 to 8:30pm Saturdays, except in July and August.

Professor Liepmann devotes single or series of programs to specific composers. Some of the recordings are of performances conducted by Professor Liepmann in past years, including concerts presented by the MIT Choral Society, the MIT Glee Club, and the Cambridge Festival Orchestra.

On Saturday, April 28, he will begin a five-week series on Mozart, which will include recordings of the *Musical Joke,* Mass in C Minor and organ music. A five-week Beethoven series will follow the Mozart programs.

This Week: Focus on Secretaries



Away from the mainstream of the Institute, but very much wrapped up in her work at the Sloan School is Jan Jefferson, secretary to Dr. Peter Gil, associate dean for teaching programs.

Mrs. Jefferson has held the position for nine years. Within the teaching development program, Mrs. Jefferson is particularly involved with the three executive development programs. "The work is the same from year to year," she says, "but the people keep changing so the job never becomes monotonous.

"Sometimes the job can be a little overpowering, when there is just too much to do. When that happens it can be bad because you find your horizons chained to one area."

Mrs. Jefferson said that many people in the Sloan School area are more oriented to Kendall Square than they are to the main campus. She said she tries to visit most of the exhibitions in Hayden Gallery when she has time, but that other events, such as the noonhour Chapel concerts and exercise classes are not really convenient for those in the Sloan area.

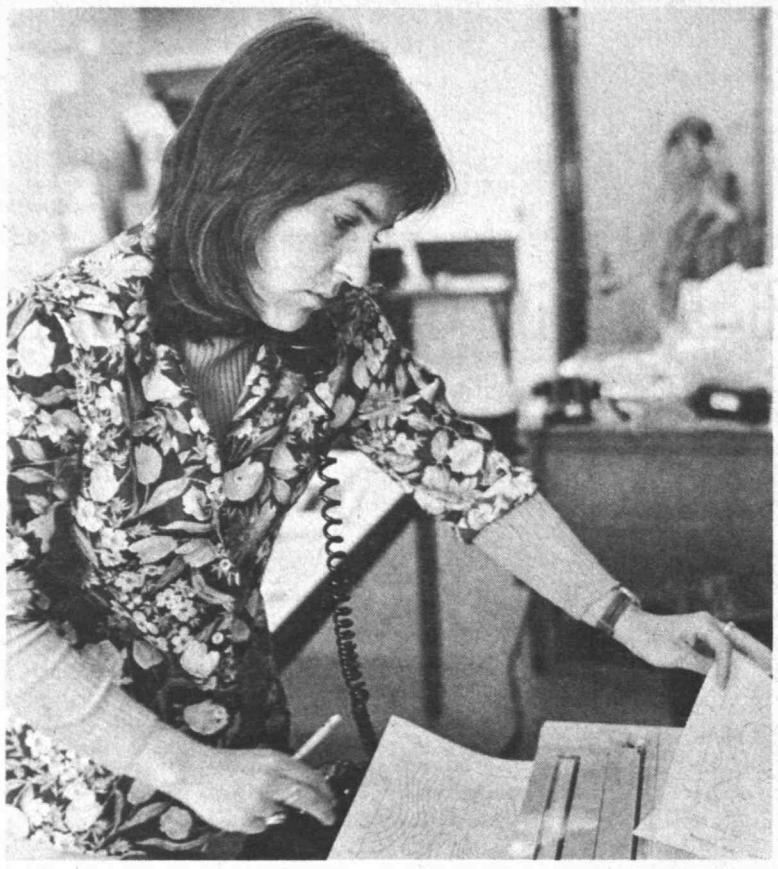
"It's really quite a different—and smaller—world here," she said.

Mrs. Jefferson thinks the "opportunity to grow" is important in job satisfaction, but notes that working pressures sometimes get in the way. On the whole, however, she likes her job. "I would be silly to have stayed here this long if I didn't," she said.

This week is National Secretaries' Week. Today is National Secretaries' Day.

Some of MIT's secretaries have come up with suggestions of appropriate ways of commemorating their week. Among them:

—Role reversal for a specified period—2 hours or a day.
—A two hour lunch with supervisors to discuss career development on the job.
—Invite the boss to watch—or participate in—a consciousness raising skit.
—Thank you certificates for bosses to give their secretaries.
—Cheese and sherry for everyone on Friday afternoon.



Susan Ashton is one of the few secretaries at MIT who gets to go to sea.

She works for Dennis Moore, executive officer of MODE (Mid Ocean Dynamics Experiment), a relatively new, inter-institutional research program in physical oceanography.

"It's not a typical nine-to-five job," Ms. Ashton said. "The people in the program are so committed that you find yourself really caring what happens to the program and very willing to work weekends when necessary."

"Sometimes the off-hours calls for help bug my roommates," she said. "For example, I got a call last Saturday at 7am, asking me to make a delivery at the airport. You have to remember that at any time as many as six ships may be working at sea—and they don't keep nine-to-five hours either. When they need something, we have to get it to them as quickly as we can."

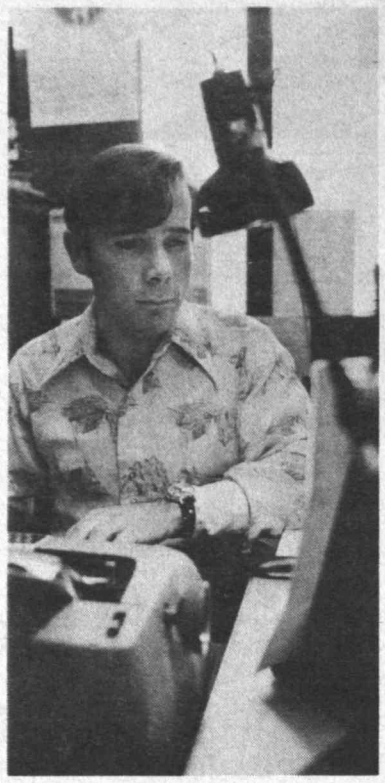
Ms. Ashton herself recently spent two-weeks at sea aboard the Chain, one of the Woods Hole Oceanographic Institution's research vessels. She was one of four women and about fifty men on the research mission.

"They weren't planning to take me originally," she said. "But I pointed out that it's not fair to be part of a research effort and not to be included on the most exciting part of the experiment.

"I stood regular four-hour watches, along with everyone else, and read and recorded meteorological data," she said.

Ms. Ashton, who received a BA in British literature from Tufts last June, said she had difficulty at first in understanding the science underlying MODE. "But with the great cooperation of the MODE people I have learned a lot, particularly in understanding the science language."

Ms. Ashton is taking mathematics at Northeastern University this term and hopes to take calculus at MIT next fall. "Then," she said, "I would like to take physics." Her ultimate goal is medical school, "but not for two or three years."



Vincent Hoskinson has been a secretary at MIT for two years but still finds that people don't know how to react to a male secretary.

"When I answer the telephone, people ask to speak to the secretary," he said. "In person, they are hesitant to deal with me. They go next door and talk to one of the women, even if their questions concern my boss. And I'm frequently mistaken for a student or teaching assistant."

Mr. Hoskinson works for Professor Warren M. Rohsenow of mechanical engineering. His duties are similar to those of most secretaries—typing (which he does at 60 words per minute), filing, scheduling, writing letters, and bookkeeping.

He enjoys being a secretary, but admits that it is an interim job. A former high school teacher, Mr. Hoskinson holds a master's degree in English literature from Columbia University. He expects to complete the requirements for a master's degree in community counselling at Northeastern University in September.

"When I decided to quit teaching, I wanted to do something different for awhile," he said. "I had done clerical work on summer jobs, so I applied for a secretarial position at MIT. At first the personnel office didn't believe that I really wanted a secretarial job. I had to convince them that I was serious."

Mr. Hoskinson thinks that a secretary's job could be more interesting if secretarial work were considered a professional, rather than menial, career. "Thanks to the Women's Forum and the appointment of Dr. Mary Rowe, MIT is beginning to realize that secretaries are a valuable and meaningful sector of the community," he said.

Marine Policy Lecture Topic

Two public discussions on marine policy will be given at the Woods Hole Oceanographic Institution at 8pm April 27 and May 2 under the auspices of the WHOI Marine Policy and Ocean Management program.

The first will be a panel discussion of "The Limits of National Jurisdiction and the Common Heritage Concept." Professor Myers S. McDougal of the Yale Law School will be moderator. Panelists will be Ambassador S. Jayakumar, permanent representative from Singapore to the United Nations, and Sergio Martins Thompson-Flores, First Secretary of the Brazilian Mission to the UN.

3 from MIT to Join Panel On 'Women in Technology'

Three MIT women will be among panelists in a discussion of "Women in Technology: Your Future, How Will You Deal with It?" sponsored by the Boston Section of the Society of Women Engineers, (SWE), on Wednesday, April 25, at 7:30pm in the Faculty Club penthouse.

The discussion will center on how and why women can pursue technologically based careers successfully and the means of encouraging more women to do so. The discussion is open to the public and women students are especially invited to attend.

Panelists from MIT are: Professor Mildred S. Dresselhaus, associate head of the Department of Electrical Engineering, Dr. Mary P. Rowe, special assistant to the president and chancellor for women and work, and Rhoda Honigman, a staff member in the Air Traffic Control System Analysis and Design group at Lincoln Laboratory.

Other panellists include Dr. Martha Bergin Thomas, engineering manager, phosphor chemical laboratory, GTE Sylvania Lighting Center and recipient of the SWE Award for meritorious contributions to engineering; Ann Blackham, lawyer and realtor; and Betty Lane, an electrical engineer at Raytheon.

Lecture on ERTS

Dr. Nicholas M. Short of the Laboratory for Meteorology and Earth Sciences at the Goddard Space Flight Center, will present the Tau Beta Pi spring lecture, Thursday, April 26, at 4pm in Room 6-120.

Dr. Short's lecture, entitled "ERTS-1: Earth Resources Technology Satellite," will discuss the practical applications of the satellite's instrumentation in the exploration and management of the earth's natural resources.

CLASSIFIED ADS

Ads are limited to one per person per issue and may not be repeated in successive issues. All ads must be accompanied by full name and Institute extension. Only Institute extensions may be listed. Members of the community who have no extensions may submit ads by coming in person to the Tech Talk office, Room 5-111, and presenting Institute identification. Ads may be telephoned to **Ext. 3-3270** or mailed to room 5-105. Please submit all ads **before noon, Friday, April 27.**

For Sale, Etc.

Hobart cable spinnet piano, 5 yrs old, $400. Dianna Gamble, X3-5831.

Lg wooden desk, $25. Sherry, 547-2863 lve mesg.

Scotts hd lawn mower, lg sz, w/grass catcher, used 1 season, orig $60, now $35. Bob, X8-4464 Draper.

Garage sale, this weekend, 10am-4pm, lv country, all items must go at any price, for directions call. Martin Wienshienk, X5470 Linc.

Step ladder 48" hi; hvy metal lawn chr; electric pan, old crockery; wash basin; brass & copper bowls; swing drapery rods; swivel bk desk chr; old brass bell. Lucille, X3-2710.

Garrard Lab 80 MK II trntbl, wood base, dust cov, manuals, cables; Pickering V15/AME-2 cart w/ellipt needle, ext stylus, orig, $150, now $60 or best. Steve, X0803 Dorm.

Bolex H8 stand 8mm movie camera w/12mm, 35mm, 75mm lens & 8mm film dev equip, $50. Bill, X8367 Dorm.

Olympia, typewriter, elect, bus sz, fairly new, exc cond, $60 wl nego. Debbie, X3-6002.

Pr of Sears Dynaglass G78-14 tires w/rims, 3 K, $45. Larry, X3-3623.

HP-35 pocket calculator. R. White, X8357 Dorm.

Seatrain concert ticket, orchest row J, 4/28, $4.50. Sandy, X3-4341.

Comp set Great Books of the Western World, incl children's vols, Gen Introd, vols and bkcase. Exc cond. Vince, X3-6249.

Zenith 12" TV w/stand, BW, UHF/VHF, wks lk new, best. X3-7902.

King sz watbed nds new home, hter & frame, warr still ok, $45. Arleen, 492-5672 evgs.

Pr of Michelin 700-13 tires, w/Mich tubes on '64 Corvair rims, $35 pr or best. Bill Huggins, X3-3223.

Motorola 12" BW TV, VHF/UHF, $15. Mark, X3-7114.

Banjo, 5 string, gd cond, nearly new, $50 or best. X3-1834.

Kiln, Norman electric, 18x18x18, w/posts, shelves & pyrometer, $350; '71 Honda CB 175, 650 mi, lk new, $450; Bell TX 500 helmet, sz 7 worn 2, $25; Whirlpool 19cu ft, frost free refrig, $250; Westinghse, dehumidifier, $50; sm desk. X183-255 Draper.

Sears Coldspot a c, 5 thou BTU, 1 yr, $130; Carrier rm ac, same BTU, 2 yrs, $100. X5763 Linc.

Wrought iron couch, 2 sect & arm chr, $65. Glenn, X8-3586 Draper.

T recrd; vac cleaner; transist transrcvr; braided phosphor bronze wire for antennas or fishing. Jim, 494-8414.

Folding grocery cart, nv used, $4. Dean, X3-6306.

RCA TV 19", BW, $30; pr of 194-14 Michelin X rad snos w/rims, $40. Tony, X3-7427.

'63 Johnson out/bd motor, elect start, gd cond, $225. Kenneth, X5379 Linc.

Sears washer, $75, orig $159; dryer, $50, orig $109, or both $110. 868-6598 days/evgs.

Handcrafted rosewood class guitar w/hd shell case, orig $330 for both, now $150 or best. Wayne, 782-0539 evgs.

Pr 6.00x14 Firestone blk wall nylon tires on Rambler Amer wheels, 1 exc, 1 gd. $15 for pr. X3-4618.

Crib, playpen, carbed, baby carrier bkpk, baby dressing tbl, 2 Samsonite suitcases. Barbara, X3-6786.

Men's br loafers, new, nv worn, sz 9 D. Mary, X8-1471 Draper.

Kodak pocket instamatic mod 60, orig $130, now $70; Kodak pocket carousel sl projector mod 100, $50, both items br new nv used. Don, X8-3333 Draper.

Geunet m 10 spd bike $100; wat bed, $95; Philco R, $20; Hitachi cass recrd, $45; class guitar, $70; HeathKit 10-18 oscilliscope, $100. Wink, X8534 Dorm.

Pr Rectilinear III's, hi boys, 3½mo old, w/warr, best. Lloyd, X9465 Dorm.

Orig silver jewelry designs at reas prices. Rochelle. X3-1752.

Pr cycle helmets, lg & sm. Martin, X3-7560.

Westinghse a c 10,000 BTU, v hvy, fits in reg windows, fine cond, $85. Bob, X8934 Dorm.

Kenwood KR 3130 recevr, yr old, 18 w/ch, still warr, w/orig carton. $125 or best. Bob, 254-2392.

Kenwood 4140 AM/FM stereo recvr, 8 ohms, less than yr, exc cond, orig $300, now $200; pr of EPI 100 spkrs, 8 ohms, same age, $125. Mike, 247-7790.

Compact refrig, exc cond, $40. 491-4377.

Gdyr 6.15x13 on rims, 1 new, $20 pr; 115/230 elect motors, ¾, ½, 1/3 hp, overhauled, $15, $10, $10. 782-2373.

Raleigh chopper boys' bike, 5 sp, 20", gd cond, $20. X3-4710.

Stereo FM/AM recvr, Gannad trntble, 2 sm spkrs, exc cond, $70. Peter, X3-7530.

Exercycle, 2 spd, hvy duty motor, pwr oper seat, peddles & handlebars, $350. George, X3-5558.

LR & K furniture plus items for study or bedroom, exc cond. Janet, X5768 Linc.

Pioneer SX 600T hifi, pr Kenwood KL 50 A spkrs, $185. Humphrey, X5470 Linc.

Bike rack for 2 bikes, trunk or roof, nv used, orig $40, now $25. Susan, X3-7922.

Heathkit amp, AA21D, sol st, full controls, orig $150, best offer. 625-8937.

Stamp collection, US & foreign, singles & sets. Ken, X3-6386.

Cust md bronze screens w/2" wood frame, sz: 31"x45½", 4; 36"x50", 4; 28"x37½", 2; all for $60. Carlo, X8-2816 Draper.

Ital prov DR set w/3leaf t, 6 chs & buffet; Ital prov LR couch 90" deep pink. X3-6702 before 2pm.

Whirlpool washer/dryer, 3 spd cycle, $50; easy automatic, $25; sm Frig washer $25. Lou, X3-1549.

Admiral combo stereo & BW 24" TV, exc cond. $150. Mrs. Alexander, X3-1467.

New & used leotards & footless tights, all clean, gd cond, some tie-dyed, cheap. Helen, X3-2957.

Mattress, dbl sz, 7 mos old w/wooden platform, $20. Elsie, X3-3796.

Gossen sixticolor color correction lgtmeter w/8 Tiffen series 7 decamired filters, cases, instr, $40; calumet CC-401 4x5 view camera w/case, lens boards, extra rail, $100; lens and film holders avail; st wheel krok lok, $3. Hank, X8-2781.

Fuji bikes, 10% off net, also parts wholesale, come to MIT Wheelmen, Thurs, 7:30pm, Rm 1-246 or call 354-6234.

Easter pink coat, dbl-breasted, sz 14, exc cond. Paul, X3-1636.

A C Chrysler air temp, 14,000 BTU, 220 volt, used 2 seasons, $200, orig $260. Chuck, X3-1832.

Century old steamer trunk, metal cov, wd bound, nat wd inside, 2 compart in dome, exc cond, $30 or best. Elaine, X3-7043.

Pine dresser, 3 drwrs, avail now, $25. Lucy, X8-2889.

Sencore transistor testor; Heath FM stereo generator, best offers. Anita, X3-2049.

Tire, G-78-14 belted w w, grt spare, many miles to go, $5. Jerome, X3-6291.

Vehicles

'58 Merc 4 dr sed, runs well, nds paint, $200; '62 Volvo 544 body, b o for parts, '66 VW bug body wrecked, gd drs, glass, and tr, 36 hp, VW eng in parts, $20; '64 Volvo 122 body for parts. Rob, 492-4785.

'63 Ford Fairlane, 4 dr, gd cond, reblt eng, new tires, batt, perf Camb car, $200. X3-2092.

'64 Ford Galaxie convert, $200 or best. George, X461 Linc.

'65 Ford st wgn, $150. Jim, X3-4523.

'66 VW bug w/sunroof, non-working, $100. Kok Ann, X3-3213.

'66 Chevy 2 dr hr top, auto, p st, runs well, $500 or best. Fred, X3-2484.

'66 Chevy II Nova, 2 dr sport coupe, 283-V8, marine blue, runs well. $275. Norman, X3-4547.

'66 VW, runs well, lks gd in & out, many extras, must be seen, best over $475. Steve, 247-7775.

'67 Lotus Elan series III, exc cond, must sell, $1,895 or best. Richard Wolfson, X207 Linc.

'67 Chevelle V-8, auto, p st, vinyl roof, best offer over $500. Louis D'Amario, X8-1547 Draper.

'67 VW bug, $300. K. Perry, X7614 Linc.

'67 Ford st wgn 289V-8, std, gd cond, $400. Perkins, X3-7121.

'68 Ford Mustang, 6 cycl, stnd flr shift, wh w/blk vinyl roof, gd cond, $950 firm. X3-6160.

'68 Volvo 142 auto, 49K, vy gd cond, $900. John, 738-7455, evgs.

'68 Jeep Wagoneer, exc cond, rec overhauled, 4 wh dr, auto, p st & br, $1,875 or best. Ted, 738-8047.

'67 Camaro, 396 C10, new Hurst 4 spd positraction, wide r tr, 4.11-1 rear end tach, full instrumentation, rec reb, some dents, $950. 731-5112.

'68 Fiat 124 spider conv, 4 rad tires, 2 rad snows, nds some wk, $500 or best. 536-5497.

'68 Chevy II nova, V8-307, R, 3 spd tr, exc cond, $850. Mark, X3-7412.

'69 VW camper, gd cond, new st snows, 38 K, gd price. Walter, X3-3145.

'70 Austin America 43 K, std, $600. Mike, X3-6035.

'70 Impala, red hdtop w/blk inter, p st & a c, 37 K, exc cond, $2,000. 244-0609 evgs.

'70 Pontiac Le Mans st wgn, 6 cycl, auto, p st & br, stereo 8 tr FM, 30 K, w/warr, $1,500. Deh-I, X8-1598.

'70 Maverick, gd cond, $1,300. Ulysses, 494-8476 evgs.

'71 Chevy Nova, 2dr, p st, auto, 53 K. Ted, X8-3391 Draper.

'71 gr Datsun st wgn Pl 510, 63 K, 25mpg, new tires, R, complete recrds, nd qk sale, $950. Carle, X3-6659.

'72 Toyota Corolla, 2 dr sedan, auto, 7½ K, studs, R, gd cond. $1,800. X3-4981.

Puma tent trler, slps 6, no frills, $400. Mr. Peters, X230 Linc.

Herreshoff 12½ (waterline lgth), gaff rig sloop, sail no. BB 51, ready to launch, gd racing record, $950. George, X3-2238.

Housing

Bedford, 2 BR ranch, ideal location, acre wooded lot, LR, DR, basement w/second B, 2 car garage, many extras, hi $30's. Marilyn, X5378 Linc.

Brkline, sum rental, 10 RMs, n T, 6/1-9/1, $350/mo. Mr Lipsky, X3-5261.

Bcn Hill, lg 2 BR, LR, D, porch, study, K, avail 6/1 opt to renew, $225. Earl Kessler, X3-1477 days.

Bcn Hill, sum sublet studio, attractive, artistic, best location, 6/1-9/1, $185/mo. Ann Hanks, X3-4896.

Camb, n MIT, 3 or 4 BRs, sublet 6/1 w/opt, friendly bldg w/strong tenants union, $180/mo incl ht. Sally, 354-3349 evgs.

Camb, 2, 3 BRs, mod apt, n MIT, comp furn, a c, w w carp, sum w/opt, $250/mo. 492-2937.

Camb, sum sublet, opt to renew, BR, mod bldg, a c, car space, n T. furn or un. 354-0713.

Camb, Dana St, 2 BRs, LR, w/frpl, DR, avail 5/1, $234/mo, ht incl. 868-9522.

Camb, 3 BRs, LR, lg K, n T sq, $235/mo; Standard tuner, BSR 510 trntbl w/ADC 90X cart, air suspen spkrs, $150; Bost-Paris air ticket, $100. Robert, 492-4282.

Camb, sum sub, avail 5/25-9/1, 2 BRs, a c, w w carp, d/washer, furn comp, pking, laundry, n Porter Sq, $195/mo + elec. 623-1336.

Camb, n Cen Sq, BR w/pking, sublet, opt to renew, avail 5/1, $215/mo. Diane, X3-5763.

Camb, BR, K, LR, rec renov, avail 5/1. X3-1805.

Hy Pk, 2 BRs, w w, D area, a c, pool, balc, pking, $223/mo. Tony, X8-4107 Draper.

Lex, cape hse, overlking Bowman school 3 BRs, 2 B, DR, LR, study & fin basement, wooded lot, garage, avail 9/1, hi 30's. X3-5330.

Lex, in Turning Mill area, attrac contemp, 4 BRs, 2½B, lg LR w/frpl & DR area, mod K, ¾ acre wooded lot, 2 car garrage, mid 60's. X3-2934.

Som, sum sublet 6/1-9/15, BR furn, 4 RMs, yd, porch, garage, n T, $144/mo + util. Carl, X3-4858.

Som, n Porter Sq, mod BR, d/washer, laundry Rm, disposal w w carp, lot pking, wl sell frun, avail 6/1 w/opt, $210/mo + elec. Tony, 623-2336.

Westgate II, sum sublet, 3 BRs, furn, avail if affiliated w/MIT, beautiful view. Dean Kross, 494-9167.

Eastgate, furn BR, sum sublet, avail 6/1-8/31. 494-9079.

Martha's Vineyard, Gay Head, 1.8 and 3.6 wooded acres w/brook and view of Eliz Islands. Dr. Colton, X3-1555.

Penoboscot Bay, Me, Little Deer Isle, 3 BRs cottage, on water, 6/16-7/8, $100/wk; W. Newton, lg cool comfort hse, conv to trnpke, 4 BRs, 2 studies, fully equip K, 6/16-9/4, $350/mo. Bloyd, X3-2983.

Vt sum home, rent for June, and July, all conveniences, swim. X3-7187.

Animals

Rare Tibetan spaniel f pup, last one, 7 wks old, parents brought fr Nepal, dwormed w/shots. Wanted: 2 BRs apt or hse w/enc yard fr 6/1. 491-4873.

Lost and Found

Lost: pr of partially brken shell rim glasses in brw case, $1 rewd. Mike Neff, 262-3192.

Lost: '71 MIT ring w/name inside, 4/17, rewrd. Robert Price, X3-3220.

Wanted

Takumar lens, 35mm. Peter, X3-6782.

Trail bike, 2 or 4 cycle, 100-125 cc, gd cond. Mardi, X3-4333.

Ride to NYC, lv 4/27, retn 4/29 or 30. Fran, X3-1607.

Pr of used Sears rad, 195.14. Jack, X8-4595 Draper.

Camb 2 or 3 BRs apt, for family w/2 well behaved children. Charlene, X8-1507 Draper.

Used trunk. X3-6240.

Rmmate for Westgate II, to shr w/3 rmmates, avail now, $109/mo. 494-9231 or X3-5900.

Rmmate for 2 BR, a c furn, K, LR, avail now, $215/mo incl util. X3-7537.

Male or fem rmmate, 2 BR apt, own rm, n H. Sq, avail now, $97.50 incl util. Ruben, 547-0745 or X3-2343.

Rmmate for W/town lg apt in hs, own lg rm furn, pking, avail 5/1, $80. X3-1932.

M rmmate as 3rd in Northgate, n Tech Sq, avail 5/5, $78/mo negot. Mark, 868-4890.

Rmmate for sum in Westgate II in 4 BRs apt, own Rm, avail now to 9/1, $112. David Hart, X3-5095.

Rmmate to shr 4 BRs, n MIT, own rm, 5/4-8/15 flex, $79/mo. Jon, 547-3323 evgs.

Rmmate, fem, 20's to shr w/another fem lg apt, n Harv Sq, own rm, $96.50 + util. Nancy, X3-1573.

Rmmate, apt w/own lg Rm, unfurn, avail 6/1, in Camb, $72. John, X3-3811.

Hse or apt, furn or un, beg 8/1 or 9/1 for 1 or 2 yrs, $350 unfurn, $425 furn. Meredyth, X3-6694.

Numismatist to teach short course to youngsters. X3-5745.

Bike, 3 or 1 spd. Jan, X3-5743 lve mesg.

Almanacs in gd cond, 50 cents per copy, will nego. Marty Davidoff, X3-1461. Lve mesg.

Sabbatical bound? respons grad student & wife lking for sublet for a yr, n MIT, avail 9/1-7/1. Jessica, X3-2281.

Boat trailer for 12' boat. Max, X3-4368.

Miscellaneous

Wood flrs sanded and finished, profess. Denny, X3-5606.

Boat charter Pearson 30, 30' sloop, for bare boat charter, slps 6, 30 hp, wkly basis aft 7/1, $375/wk. X5464 Linc.

Wl do gen & theses typing. Jane, X3-6994.

Wl do gen & theses typing. Nina Robinson, X8-3333 Draper.

Offering a beaut 5'6" Yamaha Grand piano, perf cond, won't fit in my apt for fall, for 2 yr rent, sm fee plus moving costs & deposit, avail 9/1. Hy, 232-7959.

Pro exp editor wl edit theses etc, for pbulication, all subjects, reas. Marjorie, X3-2507.

Positions Available

Executive Officer – DSR Staff for Mid-Ocean Dynamics group will manage multi-institutional and international oceanographic deep sea program; supervise, under responsibility to the Co-chairman of the MOD Executive Office, overall responsibility for all project funding, logistics of the field program, scheduling of ships and projects, publication of results, and planning future field work projects. PhD physical oceanographer required; experience as Chief Scientist, having conducted research at sea. Ability to write and negotiate proposals, experience with relevant Washington agencies, good theoretical knowledge of geophysical fluid dynamics. Fluent English; Russian language useful. 73-325.

Technical Assistant Perform experiments using both biochemical and microbiological techniques from planned protocal; minimum supervision; organization and ordering of laboratory supplies. Bachelor's degree in Biology, Bio-chemistry or related fields required; also, one year's experience in a biological laboratory. 73-317.

Administrative Assistant/Interior Desinger will assist the furniture buyer; maintain files and sample collection; assist with project budgets, expedite purchase orders; meet with clients, select items and prepare furniture layout drawings. Bachelors degree in architecture or interior disign; minimum of 3-5 years experience with emphasis on institutional furnishing. 73-314.

Secretary IV will provide general secretarial support for two professors in an academic department. Assist in administration of an undergraduate course; room arrangements, roll cards, roll sheets, grade sheets. Excellent skills and experience required. 73-311.

Secretary IV will type reports and correspondence; schedule meetings and appointments, make travel arrangements, handle account records, responsible for student records. Experience needed to coordinage the office workload and set priorities. Much contact with students and faculty. 73-324.

Secretary IV for two staff members in an administrative office. Good typing skills needed for correspondence, reports; light accounting, maintenance of petty cash; perform reception duties for office. Previous experience and the ability to organize and research material important. 73-295.

Editorial Secretary IV or Editorial Assistant V will work for student editors of a department publication. Experience in journalism and editing; background in math and economics important. Will do copyediting, production, layout, and proofreading. 73-321.

Secretary III or IV Two openings in an academic department working for 2-3 Professors. Good skills of shorthand and typing, organizational ability and experience required. 73-323 73-322

Technical Typist III will type technical reports and theses for publication and distribution; maintain laboratory library. Strong typing skills and experience in preparing technical reports. 73-320

Secretary III in project lab will need some previous office experience and good typing skill for typing technical reports and handling other general secretarial duties; use of some edit routines on Multics computer terminals. 73-319.

Accounting Assistant V in academic headquarters, must have bookkeeping/accounting experience, with MIT experience particularly helpful, to work with all departmental, Institute, Fund and DSR accounts; preparing payrolls, handle transfers for all payrolls on SANDI and DINDI reports, maintain files on individual professors' accounts; calculate monthly analyses from statements; provide support to administrative officer in budget preparation, projections, research budget proposals, etc.; prepare graduate student appointments; maintain appropriate files for accounting, budget, and payroll information; some typing ability necessary. Please call X3-4251 for an appointment.

Dramashop To Present Synge Play

The MIT Dramashop's major spring production, J.M. Synge's "The Playboy of the Western World," will open at 8:30pm Thursday, April 26, in the Little Theatre.

The classic comedy is set in a country pub on the west coast of Ireland during the early part of this century.

According to Professor Joseph D. Everingham, who is directing the production, "the play is today considered a masterpiece of Irish drama, but it provoked rioting at the Irish Abbey Theatre in Dublin during its premiere in 1907 and again in Boston three years later."

Additional performances are scheduled for Friday and Saturday, April 27 and 28, and Friday and Saturday, May 4 and 5. Admission is $2.25 for all performances. Reservations may be made by calling X3-4720.

Urban Action Planning Gala Spring Festival

MIT Urban Action is planning a two-part spring festival to be held Saturday, April 28.

Highlight of the festival will be a cabaret from 8pm to midnight in the Bush Room (10-105), with live music by The Church of Grace and Harmony on the Moon and in the Jungles, Too.

Admission to the cabaret is free, but donations will be accepted to help support Urban Action projects such as Tutoring Plus, Education Warehouse and the Group School.

Urban Action has also planned an afternoon children's festival on Kresge Plaza beginning at 1pm. Activities will include a puppet show, a mime group, relay races and games.

Psychology Lecture

Douglas H. Heath, professor of psychology at Haverford College, will discuss "Maturing and the Educational Process," Tuesday, May 1, at 3pm in the Little Theatre.

The lecture is the second in a series on developmental psychology and education sponsored by the Student Committee on Educational Policy and the Education Division Steering Committee.

Team Studies Boston, Cambridge Emergency Services

An MIT research team will investigate public safety operations in Boston and Cambridge, including police and emergency medical services.

The award of a two-year $698,000 grant for the study was announced this week by the National Science Foundation as a Research Applied to National Needs (RANN) program.

Richard C. Larson, associate professor of electrical engineering and urban studies, will head a team made up of ten members of the MIT teaching staff from various departments and eight full-time research assistants.

He described the project as one of the most ambitious undertakings of its kind, and said that the results should be applicable to other cities. The study is entitled "Innovative Resource Planning in Urban Public Safety Systems."

Larson said the research project would concern itself with important operational, administrative and planning problems faced by administrators of urban public safety services and would seek to devise procedures to assist administrators in reaching decisions about these problems.

Agencies that have agreed to work with the MIT researchers, Larson said, are the Boston Police Department, the Cambridge Police Department, the Emergency Medical Services Committee of the City of Boston, and the Cambridge Hospital.

Two specific areas of study, Larson said, will be the plan of the Boston Police Department to revise virtually all the patrol car sectors in the city and the Boston City Hospital program now under way to provide a new public ambulance service throughout Boston as a replacement for the service provided by the police.

One part of the study will be concerned with the development of police employee associations, such as the Boston Police Patrolmen's Association, and the impact of these organizations on municipal collective bargaining processes, police policy and rule-making and the ways in which police services are delivered.

The project also will focus on such areas as problems posed by new forms of operation, including team policing, and the projected impact of computers, automatic car locator systems and related technologies in police operations and practices.

Larson, explaining the need for such a study, said there had been a marked increase in the amount of service demanded by citizens. In some cities over the past ten years, he said, the number of requests for services has increased at a rate of 15 to 20 percent each year.

"The manning levels often have not kept pace with rising demands," he said, "and the result in many cities has been a reduction in the quality of service provided."

Typical examples of "degraded" service, he said, were:

—Delays of 30 minutes or more until the arrival of an ambulance.

—Excessively long ringing of an emergency telephone before answering by a clerk.

—Lengthy delays in police response to certain types of calls.

—Only a cursory examination of a crime scene once patrol officers are on the scene.

—A reduction in the amount of equipment available to be sent to a fire alarm.

—A diminished frequency of police patrols in the neighborhood.

"Such reductions in service can have lasting side-effects," Larson said. "A police department which appears not to care about open fire hydrants, for example, may cause citizens to become apathetic about reporting other more serious kinds of conditions in their neighborhoods."

"If a citizen's only direct contact with city government comes as a result of requesting emergency service," he continued, "a poor response could negatively affect his attitude toward the entire city government.

Professor Larson

"From the point of view of potential criminals, a police department saturated with service requests poses little deterrent threat of apprehension.

"Also, if police performance is noticeably worse in some sections of the city than in others, citizens may correctly perceive inequities in distribution of services, perhaps leading to alienation.

"Thus, the costs of poor service extend far beyond just monetary costs, incorporating many diverse social costs."

The other members of the faculty participating in the study are:

Kent W. Colton, assistant professor of urban studies and planning; Alvin W. Drake, associate professor of electrical engineering and urban studies; Joseph Ferreira Jr., assistant professor of operations research; Robert M. Fogelson, associate professor of urban studies and history; John D.C. Little, professor of operations research and management; Gary T. Marx, lecturer in the Department of Social Relations at Harvard University (to be visiting associate professor of urban studies at MIT); Amedeo R. Odoni, assistant professor of aeronautics and astronautics; Keith A. Stevenson, research associate, and Thomas R. Willemain, assistant professor of urban studies.

FUND CAMPAIGN

Requests to CSF Reach $75,000

The MIT Community Service Fund, which opened its annual fund campaign last week, to date has received requests for allocations totaling nearly $75,000, with an expected additional proposal not yet received.

Because of reduced resources, the CSF board of trustees this year did not publish a brochure describing the organizations it supports. The proposals received so far this year include requests from the four of the eight groups seeking CSF funding. They are:

Cambridge Community Center, Inc. is a long-established social and recreational center serving the Cambridgeport area. A fire at its 5 Callendar Street headquarters last fall forced the Center to move to the new Martin Luther King Elementary School on Putnam Avenue, causing a curtailment of the Center's program. However, such daily activities as games, dance, karate, and sports have continued, as have classes in crafts, sewing, and family life.

In his funding proposal, Center executive director John Martin wrote: "We understand that the Community Service Fund is also experiencing difficulty in raising needed funds. We had intended, and indeed needed, to ask for increased funding; but due to the aforementioned realization, we ask only that you continue funding us at the present level of $2440."

The Ghetto, a WTBS radio show aimed primarily at the black population in greater Boston, has asked CSF for $1,295 to subscribe to a black news service. The Ghetto is run by volunteer MIT students and is on the air Monday through Friday from midnight to 3am. According to Douglas Mayweather, producer, the programs deal with social, political and cultural topics as they appeal to black people. He suggested that a daily news feed from the Black Audio Network would enhance The Ghetto's value to its listeners.

Education Warehouse is a unique social agency which plans to put itself out of business by the end of 1974. Its major thrust is to develop educational and counseling programs for diffuse segments of the community, to demonstrate that the programs work effectively, and finally to package the programs for use by other, permanent social agencies. This year, the Warehouse has helped develop an in-school tutoring program in Cambridge high schools, and has launched a "Right to Read" program, which is federally funded.

This year, Education Warehouse asked CSF for $16,000. Last year $9,000 was allocated. Warehouse director Nancy Gray said the CSF allocation is small in terms of the Warehouse's overall budget but is significant because the money is unrestricted.

The Telephone Center at Concord Prison is seeking $1,500 from CSF. Last year the Fund allocated $1,000 to the project, which never came to fruition because of management difficulties. The allocation was used instead as seed money to help establish the Peaceful Movement Committee's half-way house in Cambridge. This year the prison administration is encouraging a communications center, where telephones could be used for making employment contacts and maintaining contacts of organized prison groups such as Peaceful Movement and Project Turning Point.

The famed German physicist, Professor Werner Heisenberg (left) of the Max Planck Physics Institute at Munich, is shown with Dr. Victor P. Weisskopf, professor and head of the MIT Department of Physics, prior to a physics colloquium at MIT last week. Professor Heisenberg postulated the Heisenberg principle of uncertainty which is an integral part of quantum mechanics. He has been visiting colleagues in the US and while at MIT conducted a seminar on his recent progress in a unified field theory of elementary particles. —Photo by Margo Foote

Emily Wick

(Continued from page 1)

tenure the number of women in the freshman class rose from 50 to 125 and the total number of female students from 337 to 700. When she resigned to return full-time to full time teaching and research in 1971, Dean for Student Affairs J. Daniel Nyhart said, "more women students owe more to her than they will ever realize."

Dr. Wick is an active leader among food chemists and has served the American Chemical Society in several capacities—as councilor, as a member of the advisory board of the Journal of Agricultural and Food Chemistry, as chairman of its Division of Agricultural and Food Chemistry and also as chairman of its Flavor Chemistry subdivision.

She has been honored as a scientific lecturer for the Institute of Food Technologists and has served that organization as program chairman for its national meeting in 1972, as a member of its Council Policy Committee and on its Committee on Education. She served too as chairman of its subcommittee on Food Chemistry and on the board of editors of its journals.

Other professional organizations to which Dr. Wick belongs are Phi Tau Sigma, the honor society for food science, the American Association for the Advancement of Science, the American Society of Plant Physiologists, the Society for Environmental Geochemistry and Health, and the American Society of Cereal Chemists.

Active in the Alumnae Association of Mount Holyoke, Dr. Wick served on the Board of Directors of the Association between 1963 and 1966, and is presently treasurer of her class.

AP to Use 'Laserphoto'

(Continued from page 1)

AP Board of Directors approved a research and development project to break out of the limitations imposed on picture quality by current facsimile methods," Gallagher said.

"That research has paid off today with a revolutionary picture receiving device that delivers pure photographs," he continued.

"It uses a laser beam as a light source, and prints pictures on a specially developed photographic paper which requires no liquid chemicals for processing."

The new picture system was developed at MIT by Dr. William F. Schreiber. He is a professor associated with the Research Laboratory of Electronics and he worked with the AP Research and Development Department.

Gallagher said the development schedule calls for installation of Laserphoto equipment beginning in 1974 and that AP "will replace every photo receiver and transmitter now in the United States during a production run lasting approximately two years."

The AP pioneered the transmission of pictures by wire in 1935 when it created Wirephoto, Gallagher said, and has since then improved the technical quality and editorial content of its photo report.

He noted that AP staff photographers have won 10 Pulitzer Prizes, more than any other news organization, and a host of other internationally recognized awards. He said photo contributions by newspaper members of the cooperative added to the editorial content.